MODEL AIRPLANE NEWS

SEPTEMBER 1957—35 CENTS

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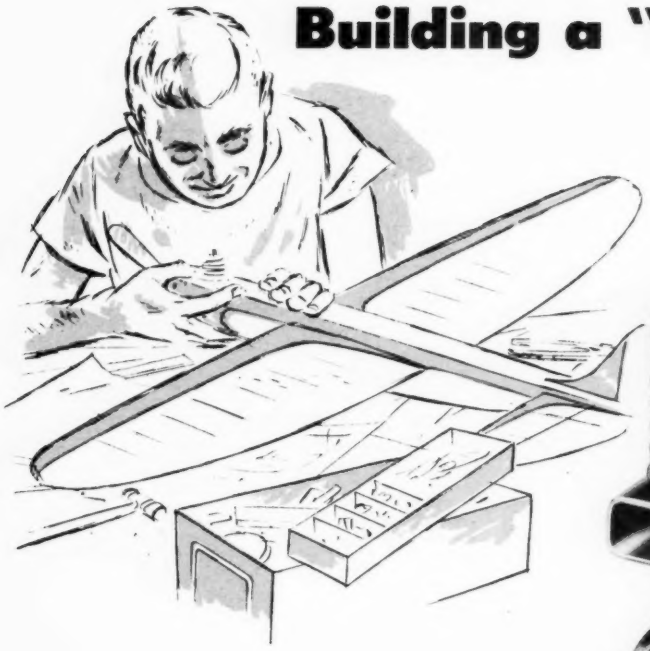

it will FLY BETTER with FOX POWER...

Contest results PROVE IT . . .
Sales records PROVE IT . . .
Satisfied users PROVE IT . . .

Ask the man who FLIES one!

THE REASONS WHY A FOX WILL FLY YOUR PLANE BETTER

1. A majority of present-day kits were designed for and tested with Fox Motors. The weight, size and power of a Fox 35 is right.

2. It has the remarkable ability to start quickly and deliver adequate power to fly your model in the unskilled hands of a beginner — *more so than any other make.*

It's not how fast it turns or how loud a noise it makes; but what really counts is how it flies your plane. Even modelers who own dozens of motors fly their FOXES most.

Of all motors made, there's still only one that starts like a FOX, flies like a FOX and wins like a FOX . . . and that's a FOX.

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Designers and Manufacturers of the World's Finest Model Airplane Motors
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WHO is the BOY on the NEW COMET BOX?

Model Building Builds Model Boys

SEND 25c FOR BIG NEW 20-PAGE BOOK "WHAT MAKES AN AIRPLANE FLY?" PRINTED IN 2 COLORS: LOTS OF PICTURES AND DIAGRAMS.

He's typical of the millions who build and fly true-to-scale model airplanes —just like YOU!

Know this young fellow? *Sure you do*—he's been visiting hobby shops and the hobby sections of many types of retail stores, in ever-increasing numbers in recent years. When we designed our colorful new boxes for Comet Kits, we put the photograph of this young fellow on them because he represents so well the model builder of today—developing valuable skills, growing in appreciation of his American heritage, eager to participate in the achievements of airplane designers, builders, and pilots. By supplying this young model-builder—and millions like him—with a steady stream of true-to-scale models in balsa and plastic—fighters, jets, bombers and executive planes—and a full line of Cements, Dopes and Paints, Comet plays a large part in creating and maintaining a widespread interest in model building. Today, the sale of model airplane kits is big business, and Comet has made—and is making—a major contribution to its continued growth.

COMET

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Send 20c for Comet's Great New *1957* Catalog

NYLON

made from DuPont ZYTEL®

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- 10 TIMES more DURABLE than ordinary propellers!
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- STRONGER than steel

- Not brittle at sub zero temp.
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NEW! Nothing like it EVER! Nylon being a material, not a plastic, is safe at any RPM of today's engines.

Almost unbreakable even in rough use such as ground loops, or hard landings of gearless combat jobs.

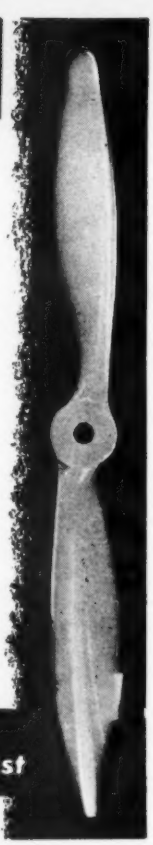
Incredible strength. Only twice the weight of wood, yet TWICE the strength of steel!

Tops performance of all others . . . even famous Plasticote Propellers.

Sizes ready now in Tractor type (right hand):

2-blade: 5½-3, 5½-4, 6-3, 6-4 ea. 25¢ 3-blade: 5-3, 6-3, 6-4 ea. 50¢
2-blade: 9-6, 9-7, 10-6, 9-4, ea. 85¢

More sizes soon. Ask for them at your local hobby shop. You'll be more than satisfied with this new high level of durability and performance! COLOR NYLONS! Just dip in any boiling Nylon dye like Rit for beautiful color props. Permanent.



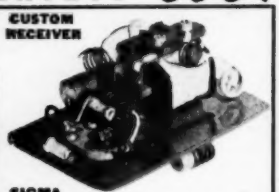
Tornado on the GO Fast

GRISH Bros. St. John, Indiana

®Zytel, a registered trademark of E. I. du Pont de Nemours & Co.

LATEST "CUSTOM MIDGET" RADIO

CUSTOM RECEIVER



SIGMA RELAY INCLUDED

CUSTOM ACTUATOR

CUSTOM TRANSMITTER BOX INCLUDED

ALL THREE $9.98

RECEIVER TUBE "IDLES" WHILE RELAY REMAINS IN UNENERGIZED STATE. (saving tube and battery)

TUBE CURRENT INCREASES and RELAY BECOMES ENERGIZED ONLY WHEN TRANSMITTER IS KEYED

SHOULD RECEIVER or TRANSMITTER FAIL WHILE IN USE MODEL COMES IN RATHER THAN FLYING OUT OF SIGHT (This new type of "Fail Safe" operation fully explained in our instructions)

Fully Re-Designed "CUSTOM RECEIVER" weight under 3 ounces including 10,000 ohm relay (relay included) plus Silver Ceramic Trimmer, midget resistors & condensors, Nylon Coat Coil wire etc. Uses one X F G I Tube which IDLES while relay not energized saving Tubes life, Batteries etc. "CUSTOM TRANSMITTER" 27 M C Exam. Free Band with pre drilled base etc. Transmitter box only 4 ½" x 5 ¾" (Box Included) may be hand held or placed on Field. Has range of 1 mile or more. Full Drawings and instructions included. "CUSTOM ACTUATOR" of new magnetic priucipal operates both rudder and elevators or rudder alone off battery supply, no rubber used for Boats, Aircraft, or Cars of small ½ A size up to large 8 ft. models. You do not have to be a Radio Expert to assemble the 3 units, all parts are tagged and marked to correspond to drawings.

"CUSTOM MIDGET" RECEIVER TRANSMITTER and ACTUATOR..... $9.98 ☐

Also Available "STANDARD MIDGET I" Radio kit, this group of 3 units, same design as above, same Relay, Same type Transmitter and Actuator. The difference from above is the Receiver weight which is greater (slightly over 4 ounces) Heavier components used.

"STANDARD MIDGET I" RECEIVER TRANSMITTER and ACTUATOR..... $6.98 ☐

PLANS FOR THE "CUSTOM MIDGET" all three units... 50c ☐

BOOKS
"RADIO CONTROL OF MODEL AIRCRAFT" $3.98 ☐
"RADIO CONTROL OF MODELS" ..... 2.50 ☐
"RADIO CONTROL SHIPS, BOATS, AIRCRAFT" ..... 3.98 ☐

'SUPPLY SOURCE DIRECTORY" Tells where to obtain Relays, Tubes, Crystals, all types equipment low as 1/20th normal prices. $7.00 MERCHANDISE COUPON FREE with Directory..... price $1.00 ☐
"SPECIAL 10 FOOT TRANSMITTER AERIAL"...$1.00 ☐ SPECIAL 10,000 OHM SIGMA RELAY...$2.98 ☐

X F G I tube...$3.50 ☐	0 to 3 Milliammeter...$3.50 ☐	Soldering Iron.....$2.98 ☐	Black Crackel Finish Transmitter Cases		
3-A-4 tube..... 1.00 ☐	0 to 50 Milliammeter.. 2.75 ☐	Battery Tester, reads 0 to 2 Volts and 0 to 50 volts..... 2.98 ☐	4" x 5" x 3"....$2.98 ☐		
3-A-5 tube..... 1.35 ☐	Both Meters above.... 5.25 ☐		6" x 5" x 4"..... 3.25 ☐		
Keying Switch.. .50 ☐	Peterson 27.255 M C Z-9 Crystal..... 4.85 ☐	Electric Motor 6 volt for Boats 2 to 4 Ft. $8.50 value..... 3.88 ☐	6" x 6" x 6"..... 3.50 ☐		
Micro Switch.. .98 ☐			10" x 8" x 7"..... 5.98 ☐		
Photo Elec. Cell .98 ☐	Resin Core Solder, Kasters 3 ounce box.. .50 ☐		Neon Bulbs 15 for 1.00 ☐		
Variable Resistor .50 ☐					

25c ☐ NEW and FULLY REVISED Radio catalogue. Shows parts as low as ½ to ¼ the price you normally pay. Also gives more details, more photos etc. of our kits....25c. **25c** ☐

MODELLERS—Check off each item you wish to order above. PRINT YOUR NAME AND ADDRESS on a separate sheet of paper with above order. Send REMITTANCE IN FULL.

RADIOMODELS, BOX 36, DEPT. M BALTIMORE 6, MARYLAND

INTERNATIONAL COMPETITION NEWS

► The new west coast member of The International Competition Committee is Harry Gould, of 3903 Lees Ave., Long Beach 8, Calif. For many years Harry has been one of the most traveled contest goers, and a member of the 1955 USA Power Team. The appointment was made June 14th by AMA Prexy Claude McCullough.

SPEED RESULTS: Only 2 Speed eliminations were held over the May 25th weekend. General interest was poor due to the fact that these models would be proxy flown, and there is nothing harder to do in this world than to proxy fly someone else's speed model. However, enough people felt that the country should be represented. Actually, the times were not too bad. Texas and California were the two areas where interest was hot enough to get the guys on the field. The results follow. At this writing the 4th team member is being withheld due to a clerical error. It would appear that some consideration may be given to those who would be able to attend the Speed Finals in person.

1. Bill Wisniewski—220 KPH (136.70 MPH)
2. Arnold Nelson—205.715 KPH (127.71 MPH)
3. Cook & Clem (team)—174.757 KPH

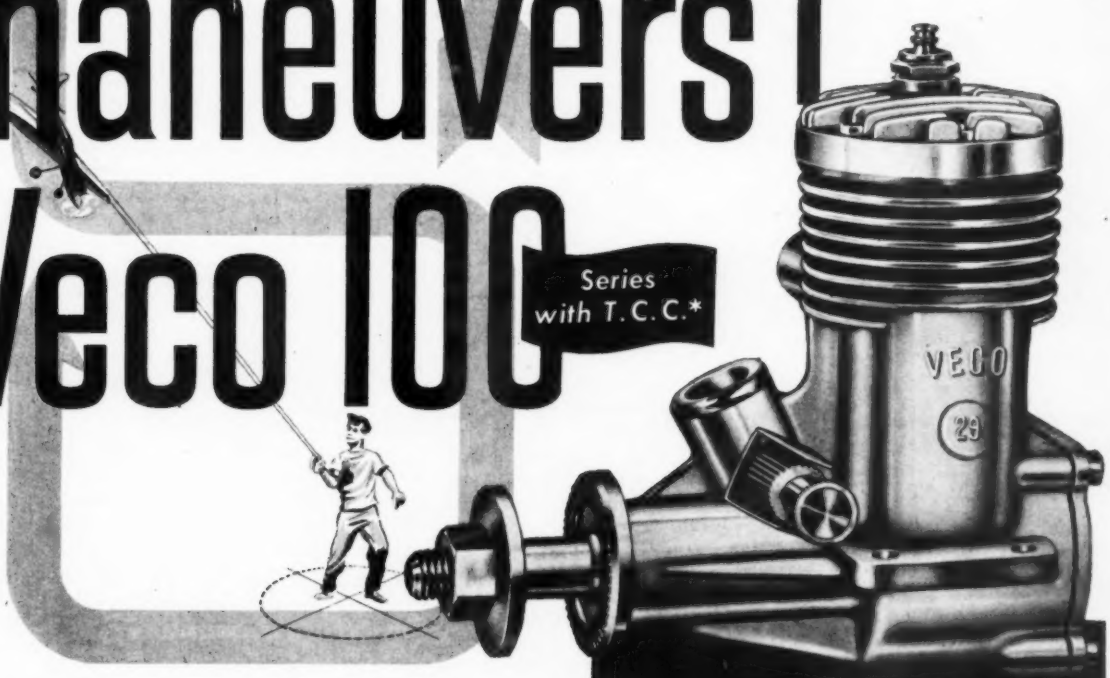
The following are the Contest Directors to contact in the various cities to get local details for the August 24-25 Power and Wakefield local eliminations.

Baltimore, Md. Bud Rhodes, 508 Epsom Rd., Baltimore 4.
Bloomington, Ind. Don Goodwin, 618 Atwater St., Bloomington.
Boston, Mass. Ed Dolby, 25 Exchange St., Rockland
Chicago, Ill. Pete Sotich, 3851 West 62nd Place, Chicago 29.
Cleveland, Ohio. Red Hillegas, 7804 St. Clair Ave., Cleveland 3.
Columbus, Ohio. Richard Beck, 556 Westphal St., Columbus.
Dallas, Texas. John Peterson, 1802 Bradford Dr., Irving.
Detroit, Mich. Ernest Shailor, 12659 Mark Twain, Detroit.
Galesburg, Ill. Ken Johnson, 350 Park Lane, Galesburg.
Knoxville, Tenn. John Tudor, 109 Chatam Lane, Oak Ridge.
Kansas City, Mo. (pending) Carl Lindsey, 904 Louisiana, Lawrence.
Los Angeles, Calif. Lo Lalisbury, 2507 California St., Huntington Park.
Miami, Fla. Sy Vos Gerau, 4024 N.W. 7th St., Miami.
Minneapolis, Minn. Mal Smith, 6200 Dupont So., Richfield 23.
New York-Philadelphia. Bob Walters, 53-20 73rd St., Maspeth, N.Y.

(*Continued on page 7*)

built for today's maneuvers!

Veco 100 Series with T.C.C.*



.19 11.95 .29 15.95 .35 15.95

see VECO'S other engines at your hobby shop.

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Here are the rugged power plants you have been waiting for to meet the rigid requirements of the new AMA maneuvers. The new "100" Series **VECO** Engines will take you through consecutive vertical square eights with no strain or sag. Rapid acceleration and constant power output make these engines a must in Team and Rat Racing. In fact, with one of these beauties you can't get anything but satisfaction. Advance carburetion, improved cooling and other design improvements combined in this Series make it the newest type of model engine power—**VECO** Power—never before obtained.

If you question our claims, see what the British had to say about the **VECO** ".19" in the February issue of their "Model Airplane" magazine.

Available in the three most popular displacements ".19," ".29," and ".35." Ask to see them at your local hobby dealer's.

*Temperature Controlled Clearance

VECO Products Corporation, Burbank, California

29th Year of Publication

MODEL AIRPLANE NEWS

JAY P. CLEVELAND, President and Publisher

SEPTEMBER 1957 Vol. LVII, No. 3

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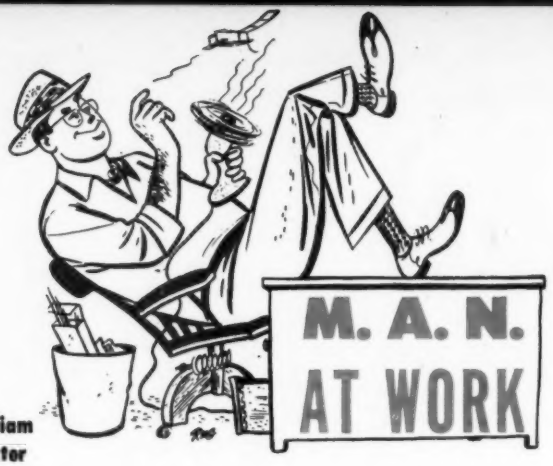

by William Winter

► At long last, thinking members of the aeronautical section of the Hobby Industry Association, are concerned about the unbridged gap between plastic models and honest-to-goodness model airplanes that you build yourself. President of the Hobby Industry Association, Al Davis, one-time modeler, and long-time major distributor, presided over a meeting of publishers and editors (the HIA also has a publishers' committee) called, apparently, to acquaint the boys with the financial worth of the business and the tremendous market that awaits the publishers' and editors' solution of the kids supposed reluctance to build anything.

MAN at Work was impressed by Al D's astute awareness that the Lost Dutchman mine is lost, and will remain lost, until someone faces up to the problem. And discouraged, immensely discouraged, that the industry expects a miracle from the press.

There is no problem of creating interest in stepping-stone projects. The problem is that there are few suitable stepping-stone kits. The industry can solve this paper problem any time it so chooses. The reasons why it does not are many and complex. It is best, perhaps, to begin at the beginning.

Until a year or so ago, the Hobby Industry Association, was called the Model Industry Association, a heritage of the day when the association was formed by the people who manufactured model airplane kits, engines, and supplies. Before long, the old MIA had included jobber and dealer members as well.

By war's end—and remember the fantastic boom, the MIA proudly spoke of a $30,000,000 yearly volume, and set their sights on $50,000,000. In the big shake-out of 1946, $50,000,000 was too silly to talk about. But now, in 1957, the talk is of $300,000,000 minimum. And this without knocking over Fort Knox. This fantastic figure reveals what happened to the old MIA and, at the consumer level, what happened to model planes you have to build.

During the 1955 Trade Show at Grand Rapids it became evident that the plane builders, so to speak, numbered between 10 and 20% of the membership which now included backyard railroads, glass beads, and numerous items that can be described accurately only as toys. Straddling both fields were (*Continued on page 7*)

NEXT MONTH'S COVER
Bonner and Palmer

PLANE ON THE COVER

One of the most durable, versatile bombers ever designed, the North American B-25 Mitchell, was built by the thousands and saw service throughout World War 2. In fact, the rugged B-25's still are seen frequently. In the early stages of the southwestern Pacific warfare, machine-gun clusters, even a 3-inch cannon, were installed in the nose. Span about 68 ft.

There's a "Cub" Engine for Every Power Application!

Priced from $3.95 to $12.95

"OK" Engines available in a complete series from .049 to .35 . . . all proved champions in control line, free flight, radio control and stunt flying. Top flight champions in value for over 19 years.

Here's a flashy performer with plenty of power for general flying. Has both radial and lug mountings. It's versatile, comes already assembled.

CUB .049B Complete with fuel tank, prop and spinner. **$4.95**

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59c

"OK" CUB .049A **$4.95**

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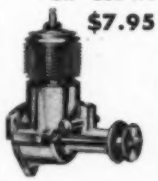
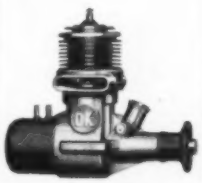
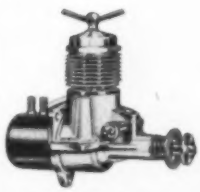
"OK" CUB .14 **$7.95**



"OK" CUB .19 **$7.95**



"OK" CUB .29 **$11.95**
"OK" CUB .35 **$12.95**



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OK GLOW FUEL for Miniature Engines

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Jetex Atom .35 ... 3.95
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Dynamite Outboard ... 2.50
AHC Pee Wee 1.25; Super ... 1.80
Johnson or Evinrude Outboard ... 4.95
Set of 3 Wonderful Wilson ... etc.

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McCoy .049 Radial Mt. Adapter ... .35
Fuel Tank—set of 3 ... 1.49
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Speed Prop (Manzanita) ... 1.49
Cleaner for 1/4A Brn. or. ... 2.50
Clean A (Top or Bottom) ... 2.50
Clean B (Top or Rear) ea. ... 3.00
Clean C or D (Top or Bim.) ea. ... 4.00
Dynacel Speed Prop ... 9.95
Infant Hopper (FF) ... 1.49
Needle Valves:
Fox, OK, McCoy RH ea. ... .50
McCoy Mite .75; K & B ... .75
2 Speed Timer—LS ... 1.75
McCoy .29; R.H. Reshicter .09 to .35 Hillspead Hdl. Valve ... .50
Fox 35 Hi Comp. Head ... 3.95
Thermo Hopper Red. Mount ... .75
K & B Radial Mt. .19, .23, .29 ... 1.50
Cub .099 Mtg. Bracket ... .25
Go-Jets (give size of engine) ... .85
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Metering Jet (Dyna) 2-3-4-5-6-7 ... .70

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All Amer. Jr. Stunt 25" B-C ... 6.95
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Bbb Jet Bomber 18" .039-.074 ... 1.98
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Barnstormer 42" A-B ... 8.95
Beercat 25" C-D ... 6.95
Beechcraft 16" AA-A ... 2.95
Beetnik 1949 17½" AA ... 2.95
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Monocoupe 18" .039 to .074 ... 1.69
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Mr. Mulligan 23" .29 to .35 ... 6.95
Mustang 37" A-B (Berkley) ... 10.95
Mustang (Sterling) 19-35 38" ... 3.80
Mustang (Veco) 48" B-C ... 7.95
Mustang (Monarch) 20" AA-A ... 4.95
Mustang P51 19½" .049 to .099 ... 2.39
P-40 Flying Tiger .19" .074 ... 1.98
Nanook 42" ... 19.95
Navigator 28" .19 to .29 ... 6.95
Nieuport 28" 33" .29 to .60 ... 6.95
No. Amer. AT6 (SNJ) 31" A-B-C ... 10.95
No. Amer. B25 67" .19 to .35 ... 21.95
No. Amer. AT6 18" AA ... 3.95
N. A. Sevane 26" AA ... 6.95
Northrop "Gamma" 16" .020-.049 ... 1.80
Omega 33" .15 to .29 ... 6.95
P38 Lightning 41" .16-.29 ... 7.95
P40 Flying Tiger 18" .039-.074 ... 1.98
Pacemaker 27" A ... 1.95
Polar Pet 16" AA ... 1.80
Pacific Clipper 18" .039-.074 ... 1.98
Piper Cub Cruiser 18" .039-.074 ... 1.69
Piper Sea Scout 16" .020 to .074 ... 1.95
Piper Super Cruiser 18" .049 to .074 ... 1.98
Pitts Special 25" A-B ... 4.95
Polish Fighter 16" .29 to .49 ... 6.95
Profile Trainer 1 24" .049 to .099 ... 3.25
Trainer II 30" .14 to .19 ... 4.50
Trainer III 34" .19 to .29 ... 6.95
Quest 30" ... 4.95
Quick Silver 18" .14 to .29 ... 2.50
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Razzle Dazzle 16" .039 to .074 ... 1.95
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Top-Notch 6/3, 6/4, 6/5, 6/6, 7/3, 7/4, 7/5, 7/6 ... 25
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Top-Notch .30 ... AND ALL OTHERS!
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Darwin Brass Pea-Wee (¾" w, ¾" h); ½" ... .50
½" ... .50
L (1¼" ... 1¼" ... 1¼") ... .75
Q (1¼" ... 1¼" ... 2") ... 1.00
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1¼" ... 1¼" ... 2" ... 1.10
Perfect: 1½ w, 1 h (2 in.) ... .69
1½ w, 1½ h (3 in.) ... .89

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Sig: 1" — 60s; 1¼" ... 80s; 1½" ... 1.00
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2½" — 1.40; 3" ... 1.75
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1" ... 1¼" ... 1½" ... 40s 1½" ... 60s
1¾" ... 2" ... 2½" ... .85

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Bonus items include: Tube of "REV-UP" Lubricant (makes your engine last twice as long!, Ownership Decal, Correct Size Propeller, Glo Engine Handbook, Mounting Nuts & Bolts, Numeral & Alphabet Decals, etc., etc. FREE at extra cost.

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C.C. Riviera 12½" AA-A ... 3.95
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NEW

"AERO COMMANDER"

By "BERKELEY" ... 33" Span U-Control model for .049 to .099 eng. 9.95

SUPER CUB

By "Cox" 7.95

READY-TO-FLY plastic model, 17½" span. Has .049 Babe Bee Engine with spring starter.

SONIC STAR

By CONSOLIDATED 17 span controllor for ½A eng. Plastic fuselage. 2.95

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MORE "AHC" SUPER BARGAINS

FAMOUS DISPLAY MODELS

A terrific bargain! They're all pre-curved and pre-sanded, ready to assemble and finish. Complete with cockpit, wheels, propeller, etc. Many have retracts, flaps, etc. Some have engine mounts, cowls, etc. Many have rubber tires. Some have wire landing gear. Some have cowls, etc. Many have rubber tires. Some have wire landing gear. Some have cowls, etc. Many have rubber tires. Some have wire landing gear. Some have

M.A.N. at Work

(*Continued from page 4*)

the incredible plastic models which have been sold in the hundreds of millions. Some people wondered openly if the Association was not an annex of the Toy Association. But several years prior, the plane people were worried enough to form an Aeronautical Section of the Association in order to discuss their own problems, unfortunately with themselves. Like a whaling seaport the Association had a singularly polyglot membership, compelling train people to meet in order to talk train problems, plane people to talk plane problems, and so on.

Drawn from widely divergent categories, the Board members could not be expected to play favorites. This, incidentally, is one big reason why the Academy of Model Aeronautics finds increasingly tough sledding in trying to sell programs to the HIA. A couple of hundred members don't even know what the AMA stands for. It follows, as night upon day, that the HIA as a whole cannot be expected to find the answer to why boys aren't building stepping-stone projects. It is quite possible that a couple of hundred members have, what is to them, bigger problems. It may be only a coincidence that a few wits have quipped that the Aeronautical Section should form their own association. Some keen arguments have been heard.

For instance, the airplane-minded hobby shop owner is usually described as a dope. He is not business minded. Not a business man. Dealers are tutored in the art of placing the cash register, various cabinets, fixing their window displays, and charming the public. Since the HIA is a varied organization it is to be expected that the hobby shop owner is expected to reflect the many, varied interests, of which the supply of materials, wood, etc., for hard-to-build models, rates low man on the totem pole The question, according to some people, is whether or not the hobby shop has been captured by crafts, trains, (toy, that is), cameras, archery, and so on. Is it a toy store?

As the dealer has been captured, so has the jobber. Some jobbers have 50% of the shelves tied up in plastics. They are more than reluctant to stock even a dozen large airplane kits because of the space required, and the investment involved. Public demand does not shape the market. Or, maybe it does? Anyway, one wonders what the plane people get out of it all. Publicity?

"Jelly Bean Brigade Fires Atomic Shells" was the headline the New York World Telegram gave to the Hobby Show. This is their story.

Four inventive kids bombarded a Big Toy Man from Nashville today with peanuts, licorice pellets and jelly beans at 500 Eighth Ave. as the second annual Hobby Industry Assn. trade show opened here.

The candy barrage greeted the arrival of the XP-1716 "atomic" train which pulled into town 182 days before Christmas.

"The five-car atomic train which is painted in realistic military colors runs by electric power on O-gauge track, but the young railroader can easily imagine that the atomic reactor car coupled to the engine carries a small piece of uranium under the three blinking lights which alert the onlooker to the 'fissionable' materials," thundered the Nashville Big Toy Man.

"Zezzzing," sailed a peanut past BTM's left ear.

"Splat," went a jelly bean against the wall.

A young railroader, Stephen Shriver, 9, of 530 E. 23rd St., who by the happy chance joined the throng of toy dealers, manufacturers and buyers at the trade show had discovered the "atomic cannon" on the train.

It is designed by Kusan-Auburn Inc.'s engineers to shoot small wooden balls. With an ingenuity familiar to teachers, mothers and child psychologists, the redhead loaded it with handy candy instead.

His confederates—Deborah Kohloss, 8, Mark Witoff, 4, and his brother Robert, 8 chortled happily.

Elsewhere at the show it was evident the trend is realistic and militaristic.

For example, scale model evident the trend is realistic precision-built miniature outboard motors driven by batteries. For the mature girl, Gem Color Co., of Paterson, showed a series of make-it-yourself jewelry sets.

International News

(*Continued from page 2*)

Norfolk, Va. Bob Champine, 35 Langhorne Circle, Warwick.

Omaha, Neb. Jerry Bahula, 6933 Pickney St., Omaha 4.

Sacremento, Calif. Robert Fizer, 1132 La Casa Ave., Yuba City.

Salt Lake City, Utah. Jay Jackson, 3205 Canyon Rim Lane, Salt Lake City.

Santa Barbara, Calif. Bill Kaupp, Jr., 609 Calle Rinconada, Santa Barbara.

Seattle, Wash. Earl Witt, Box 134, Lakeview.

Tulsa, Okla. Stanley B. Childs, 6762 Haskell Pl. Tulsa.

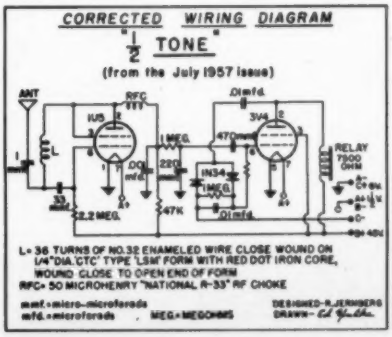
Watertown, N. Y. Bob Manigold, 608 Sherman St., Watertown.

Wichita, Kan. James Pierce, 870 Watson Lane, Wichita 18.

Semi-finals for Power and Wakefield will be held in 4 key cities, each semi-final selecting one team member for each category. Dates will be September 28-29, 1957. Team members will have all winter and spring to prepare for the finals. They can do a great deal of advance planning, which has always been difficult to do in the past because of the short time between picking of the teams and the actual finals.

In case you are wondering just how come your area doesn't have an elimination set-up, here's how to go about getting one. Obtain the names of 15 interested modelers that would guarantee to compete, and have them sign a petition. Get a licensed Contest Director and a good field to fly in. Send all this information to your nearest ICC member. Harry Gould (address above); Pete Sotich, chairman, 3851 West 62nd Place, Chicago 29, Ill. My address is 25 Exchange St., Rockland, Mass.

ED DOLBY
International Competition Committee



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Latest Design! Best Quality!
TRANS. - RECV'R. - ESCAP. TUBES - RELAY - CRYSTAL
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WITH METAL CASE
FOR ALL MODELS . . . BOATS, CARS, PLANES FROM ½A TO THE VERY LARGEST
America's Hobby Center SCOOPS 'EM ALL! We dare you to find an R/C bargain like this anywhere in the world! It's a 27¼ mc. free band unit. No operators license required. Range 1 - 1½ miles. Rugged. Safe. Economical performance. No other set—regardless of cost—is more complete! All new, latest design equipment. No Surplus! No Junk Parts! Made special for us . . . to the most rigid specifications. Outfit is all-prefabricated . . . really simple to assemble. Ideal for beginners . . . yet advanced R/C men will find this an ideal unit.
FULLY GUARANTEED
HERE'S WHAT YOU GET:
Transmitter, complete with tube, crystal and telescoping antenna; Twin-Tube Receiver, with relay and tubes; assembled self-neutralizing Escapement; Super sensitive contact Relay; Dust Core Tuner; Complete installation kit; Easy-to-follow, step by step instructions for assembly and R/C Manual. You get EVERYTHING you need to operate . . . complete, except for batteries.
FREE FCC LICENSE FORM INCLUDED
MONEY BACK GUARANTEE INCLUDED!
$39.95 VALUE
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IS ALL YOU PAY
ABOVE OUTFIT ALL ASSEMBLED
Ready-To-Operate FURNISHED TESTED & ASSEMBLED! Less Batteries
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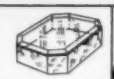
BRAND NEW!
Announcing a Super Deluxe
TRANSISTOR
"AMTRON" R/C OUTFIT
LOOK!
You can't buy a finer outfit! It's precision made . . . with a sensational TRANSISTORIZED receiver and a super sensitive deluxe relay. All complete with deluxe components and batteries. This R/C outfit is truly DELUXE . . . and really bargain priced, too!
KIT — 24.95 ASSEMBLED — 34.96
R/C FANS! AHC CARRIES EVERYTHING
Field Strength Meter
A real buy! Complete! Wired, adjusted and Ready-to-Operate, in plastic case. "AMTRON"
9.95
AHC STOCKS ALL R/C EQUIPMENT . . . WE HAVE WHAT YOU WANT . . . & SHIP IT TO YOU FAST.
ATTENTION ALL R/C FANS!
FREE AHC "BARGAIN-BULLETIN"
Ask for Bulletin "RCB". Lists many, many big bargains. Send a self-addressed, stamped envelope for your FREE copy.
SEE NEXT PAGE FOR MORE AHC BARGAINS & HANDY ORDER BLANK
America's Hobby Center, 146 W. 22nd St., N. Y. 11, N. Y.

.012 100 FT. U-CONTROL WIRE
Envelope Packaged.
Reg. 60c 39¢

6 PC. MODEL BUILDER'S ENGINE SET
REG. $1.79 98¢


AHC PARTS BOXES. Transparent plastic with hinged tops. 1⅜ x 2⅛ x ¾" high. Ideal for small parts storage. Reg. 15c each 6 for 50¢

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AN AHC SPECIAL
Fits All Std. Plugs
60¢

ENG. MUFFLER
A "must" for every engine. Cuts noise down to a "purr". Easy to use. AHC SPECIAL!
CL. A-B-C CL. B-C-D
Reg. $2.95 Reg. $3.95
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3 for $1.00
An AHC Super Value!

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GRAB-BAG
Super Special! 15 assrt. colors. One mini popsicle 1 oz. bottle. Reg. 10c ea.
Reg. $1.50 15 ASSTD. COLORS 89¢
FREE
3 drops brushes free at extra cost with this bargain deal

DECAL BARGAIN
Worth many $ $ $. You get 1 ½" AMA decals; 62 Black decals — 3 sets of nos. & alphabets; 4 stripe & bar 2"; 6 picture decals; 1 sheets solid color; 1 sheet checkerboard etc., etc., plus Tips & Hints on use of decals. A Real Bargain $1.00

REG. $2.95 $1.95
SKY-MATE
A real bargain! This contrailing model powers with .049 to .074 eng. Profab sheet construction. Have an Sale!

A BOMB SPEED PANS
ALL ALUMINUM
Reg. $2.50
1.49
Save $2.001 13½" long—for B & C class speed models

SAVE
$1.98 R/C
Deluxe Receiver
INSTALLATION KIT
98c

1½" PLASTIC SPINNERS
For A-models
Reg. 25c. For four 4" sets
19¢
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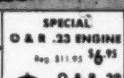
ALUMINUM SPINNERS
Finest quality spun aluminum. Sale priced to save you 50%
1¾" Reg. 90c 45c
2½" Reg. $1.20 60c

SOLDER
10¢
SOLDERING IRON
Ideal for all model work. Reg. $2.25. A Real buy. at only $1.29

"Sea Scooter"

REG. $7.95 4.95
A terrific bargain! This hydro speedboat is 24" long with an 11" beam. For gas or elect. motors or R/C. All prefab. w/mahog. exterior.

SPECIAL
O & R .23 ENGINE
Reg. $11.95 $6.95

O & R .29 ENGINE
Reg. $13.95
$7.95

GLUE TUBE NOZZLE
REG. 55c 19¢

GLUE
An AHC super bee! It fastens exactly to top of tube. Special threads to secure cap when not in use. Thread for screw, too, stop attachment. A must for every modeler.

15 DECAL PICTURES
Assorted. Perfect for dressing up your models. $1.50 Value
FOR ONLY 98c

AHC ELECTRIC
OUTB'D. MOTORS
3 to 6 volt, tubes up to 24" boats. A Terrific Bargain.
Outb'd. Jr. Reg. $3.95 1.99
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CRYSTALS
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Very Finest Quality
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An AHC Super Buy! Fully Guaranteed!
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SILK or NYLON
Finest quality. Silk colors: Yellow, Blue, Red or White. Nylon: Yellow or White. Reg. $1.50 a yd.
98¢ YD.
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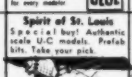
Spirit of St. Louis
Special buy! Authentic scale U-C models. Prefab kits. Take your pick.

24" MODEL For .049 to .14 Eng. REG. $2.95 1.95
26" MODEL For .099 to .23 Eng. REG. $4.95 2.95

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O & R PROPS
Reg. 35c-45c 10 for $1
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7/7 11/4 8/7 11/9 8/8
9/5 13/8 9/8 10/4
10/7 9/6 11/7 11/10 12/9
12/6 9/7 14/6 8/9
8/5 11/6 8/8 10/5
14/5 9/10 12/6

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We made a special purchase and can offer you a real "Buy" Assrtd. sizes $3.00 Value
20 for $1.00

STREAMLINE HELLY-ARC
Rubber Wheels
Terrific savings. For FF or UC models. With brass bushings. 150% less drag

2" Wheels Reg. 50c
25¢ pr.

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the Great Lakes

by VERN SCHROEDER

About 40 inches span, weight 40 ounces, Vern's GL bipe stepped lively on its K & B .35. Drawings modified—you can make either version—to show later design as detailed by Wylam plans.

Seen in rear three-quarter view, model looks like the real ship on foggy morning flight line.

Famous sport plane of the '30s, always a modeler's favorite, the Great Lakes makes an excellent U-control ship for .29, .35.

► One of the most popular sport planes of it's time, the Great Lakes Trainer has now become practically extinct. It was recently chosen by a leading aviation authority as one of the ten best-known biplanes of all times.

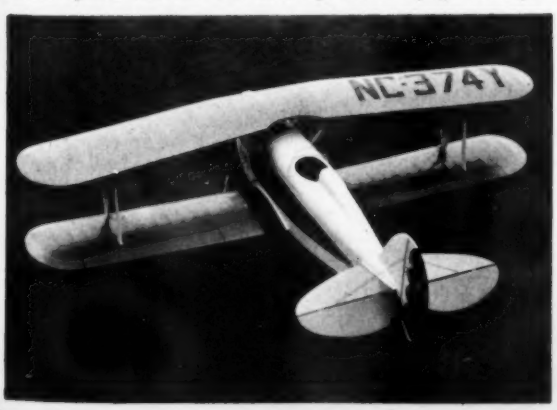
The Great Lakes Trainer was built by the Great Lakes Aviation Corporation during the period from 1929-1933. There were several models built, using different engines and cockpit arrangements, and with monor variations on engine cowlings, propellers, wheels and fairings. The ship we have chosen for our model is the 2T-1A, powered with an upright A.C.E. Cirrus III 4 cylinder in-line, air-cooled 95 h.p. engine.

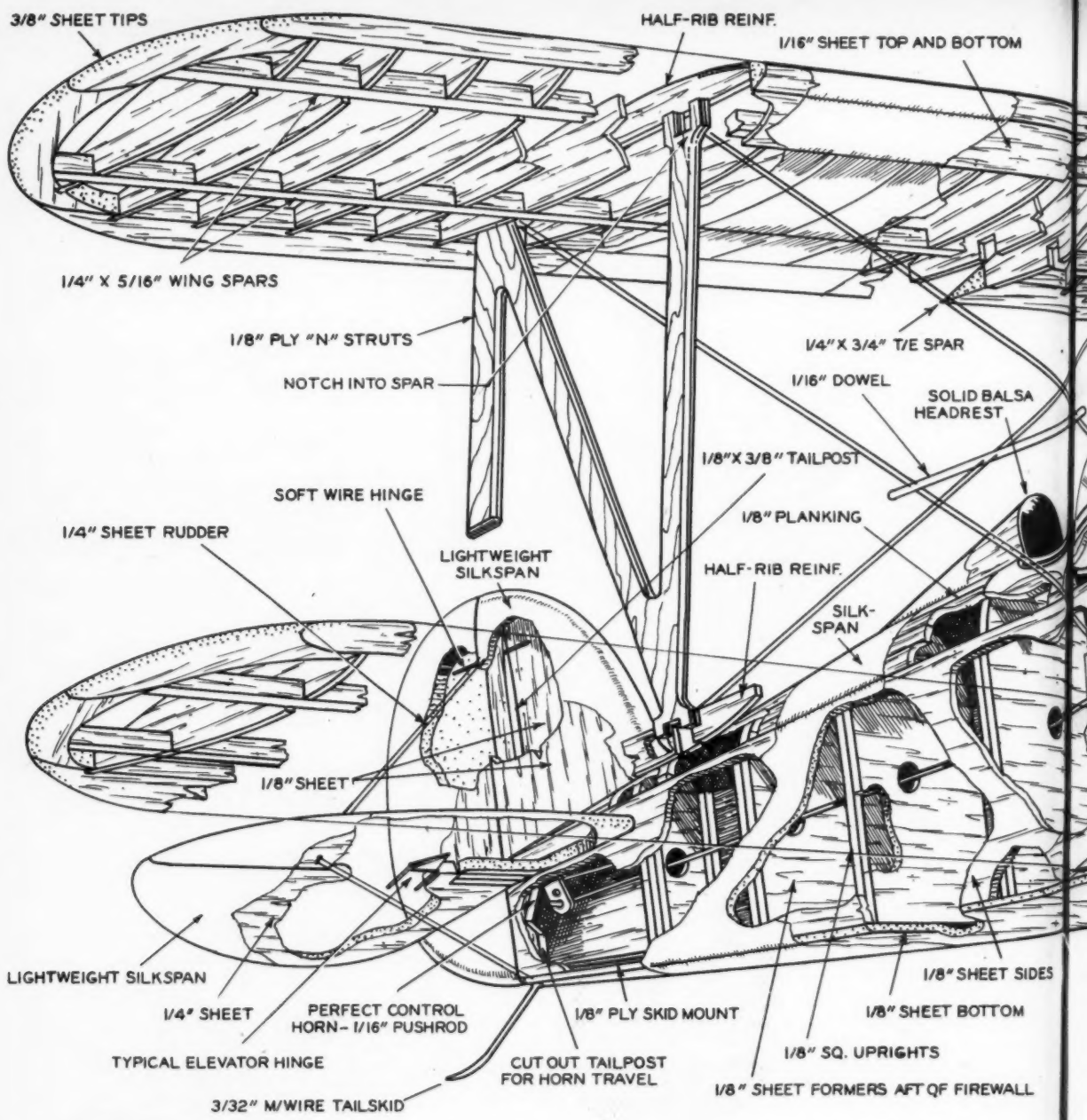
(Editors Note—According to Doug Rolfe, an old barnstormer himself, the early Great Lakes had no sweepback. A later model went to sweepback using the same cowl detail. Later, the version in our plans was produced. Mr. Schroeder, while building one version drew plans of a late model as drawn by Wylam. The model in the pictures properly has no dihedral; according to Jane's All the World's Aircraft, the model in the plans had 3 degrees dihedral in the top wing, and 2 degrees in the bottom wing.)

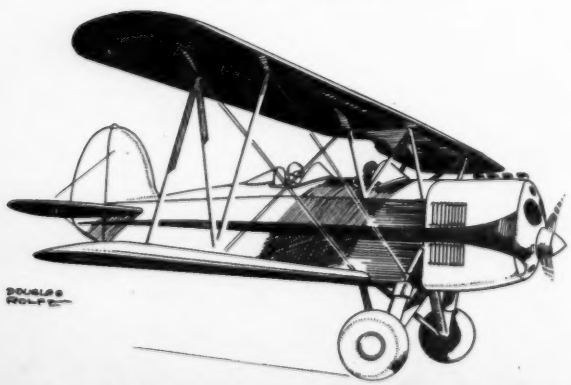
Our model is built to a scale of 1½ inches to the foot giving it a span of 39¾" and a weight of 40 oz. A K & B .35 is used for power. The model adheres as closely as possible to scale but still keeps construction as simple as possible. The ship was designed primarily for sport flying and therefore the plans do not show great detail. It is suggested that those wishing to build a more detailed model consult the Wylam Masterplans in the May 1956 issue of Model Airplane News from which the original model was designed. You will note that different type engine cowling is shown in the photos. This just barely enabled the engine to be entirely enclosed and made construction more difficult, so the design was changed to that shown on the plans.

Begin construction by cutting two fuselage sides from ⅛" sheet balsa and fastening to them the ⅛" sq. former, positioning strips shown in the top view. These strips aid in locating the formers, help hold them in place when

Closed spaced ribs and taut covering, double flying wires, paint scheme, all add realism. Silkspan with five coats sanding sealer.





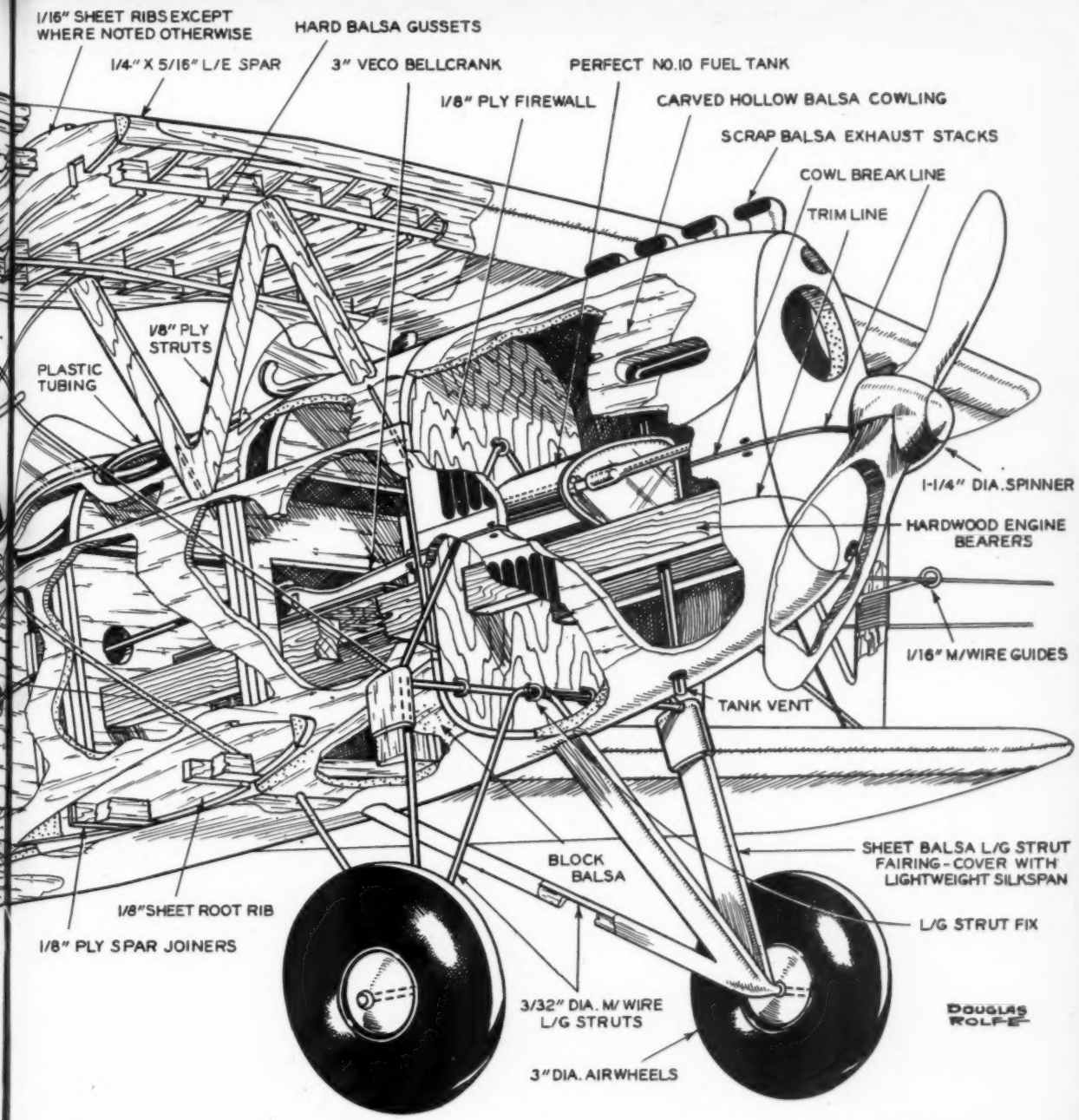


Barnstormer Rolfe says this is 1931 (2T-1A) shown on plans, with struts, rigging, cowl louvers, trim details, precisely detailed.

joining the sides and add strength to the structure. Next cut the firewall B from ⅛" plywood, the remaining formers from ¼" sheet balsa and join them to the fuselage sides, beginning at the nose and working toward the tail. The tail, position L, is not joined at this time. The ¾" x ¾" x 10¾" hardwood motor mounts, ⅛" plywood bellcrank platform, and bellcrank can be installed at this time.

Cut the stabilizer and elevator from ¼" sheet balsa and sand them to shape. Mount the control horn to the two ¼" x ¼" x 3" plywood pieces and then join the two elevator halves. Join the elevator to the stabilizer with hinges made from .040 wire and sheet brass as shown on the plan.

The fin is constructed by sandwiching a ¼" x ¾" x 6½" strip between two ¼" sheet balsa sides. Note that the fin extends down into the fuselage and joins to the stabilizer. The fin is now cemented to the stabilizer. When dry, the



pushrod is installed and entire assembly is joined to the fuselage. The fuselage sides are also cemented to the lower end of the ¼" x ¾" strip extending from the bottom of the fin. The rudder can now be cut from ¾" sheet balsa, sanded, and fastened to the fin with soft wire hinges. This completes the tail surfaces.

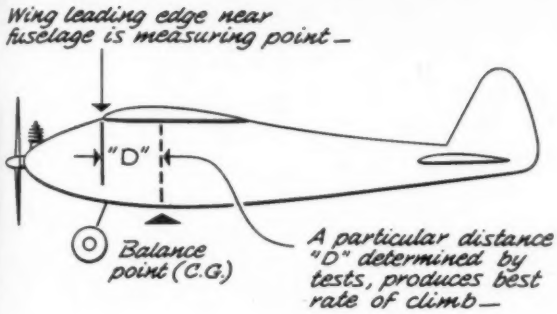
The landing gear is constructed in three pieces using 3/32" dia. wire. Pc. 1 and Pc. 2 are constructed first, checking lengths by laying them over the plans which are shown true size. Bind and solder Pc. 1 and Pc. 2 together and fasten them to the firewall with J bolts. Pc. 3 can best be formed by taking the measurements directly from the model to insure a perfect fit. Fasten the upper end of Pc. 3 to the model with J bolts. Bind and solder the lower end to the main landing gear near the axle. Be sure and

(*Continued on page 48*)

And this is 1929 (2T-1) prototype. Sweepback subsequently added, but before nose was changed for different engine, cowl, as on plan.

PLAN ON FOLLOWING PAGE

FULL SIZE PLANS AVAILABLE. SEE PAGE 56.


Wing leading edge near fuselage is measuring point—
"D"
Balance point (C.G.)
A particular distance "D" determined by tests, produces best rate of climb—

for HIGHER climb

by W. F. McCOMBS

with illustrations by H. A. THOMAS

This could be the most significant article on free flight since Goldberg turned loose the pylon gassie. Controversial, no doubt, but, if the man is right, times should jump.

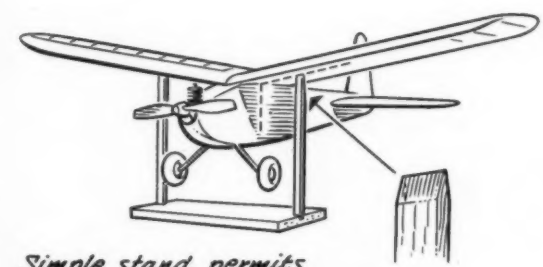
When you say climb, every modeler thinks of a screaming engine in a featherweight free flight. This big ROW bores upward at a Nats.

►Proper flight adjustment is as important as good design and expert construction. A mediocre model which is carefully adjusted can easily out perform an expertly designed and built ship which has not been adjusted for its maximum performance. This article has been written to give the average model enthusiast a simple procedure by which he can get the most duration from his planes.

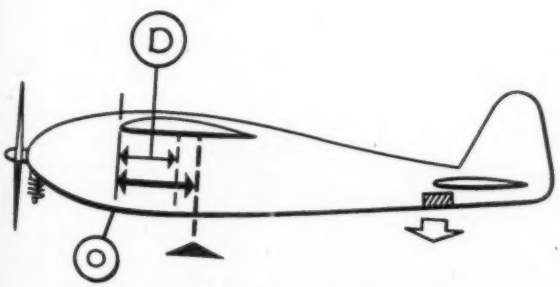
The center of gravity, or CG, location is the station or fuselage cross section at which the completed model will balance on a knife-edge. It is the fore-and-aft balance point of the complete model. The location of the CG with respect to the wing is the most important single factor in airplane adjustment.

The incidence angles are usually thought of as the angles which the wing and the stabilizer chord lines make with

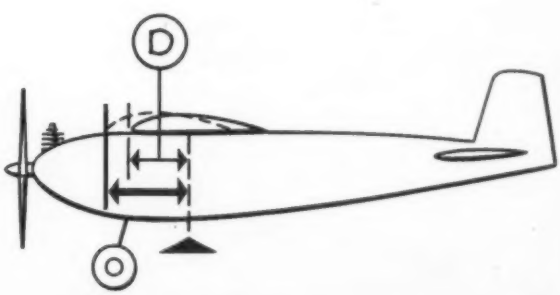
(Continued on next two pages)



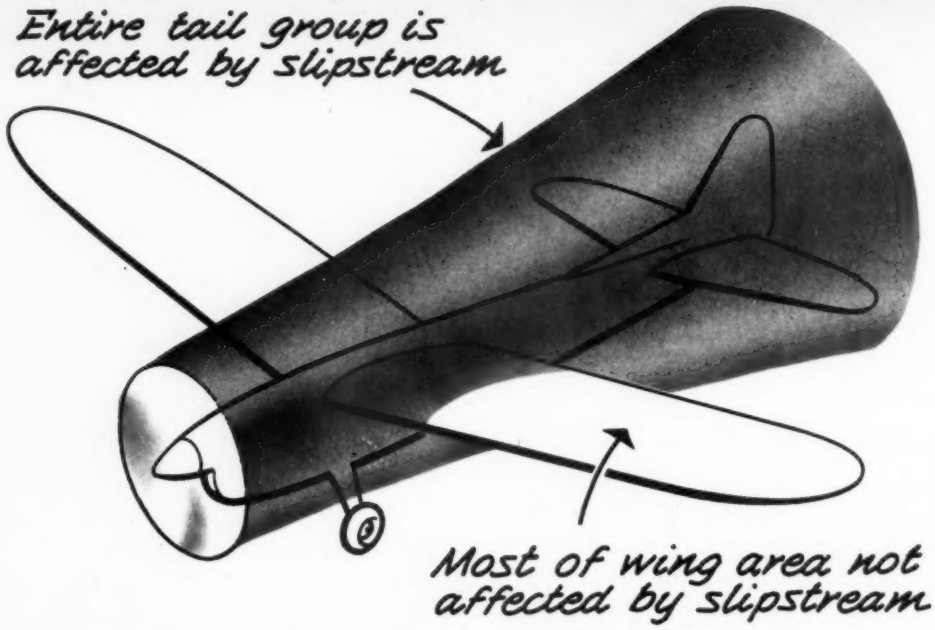
Simple stand permits locating balance point accurately



If wing is fixed, dimension "D" can be increased by adding weight to tail of model and vice versa —



If wing is movable, dimension "D" can be increased by shifting wing forward and vice versa —



some fuselage reference line—such as the fuselage center line. When the leading edge of the wing or tail is raised or "shimmed-up" we call it adding "positive incidence" (the same term applies to lowering the trailing edge). When the leading edge is lowered or the trailing edge is "shimmed-up" we call it adding "negative incidence."

Now we can give the adjustment procedure in condensed form: The stabilizer incidence is changed or varied to "trim" or adjust the glide of the model; the distance between the CG and the leading edge of the wing is changed or varied to trim or adjust the climb of the model. This second is probably the least known principle among model builders. But properly applied it can make expert fliers out of novices and contest winners out of otherwise mediocre models.

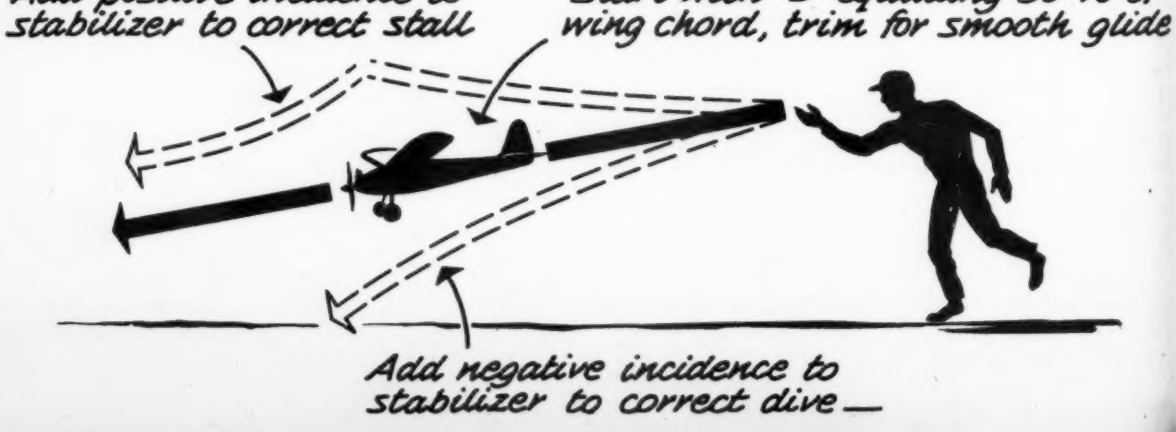
For any model there is some particular distance D between the CG and the leading edge of the wing which will produce the best (highest) climb. This distance D is shown in Fig. 1. It is the fore and aft distance between the CG and the wing's leading edge.

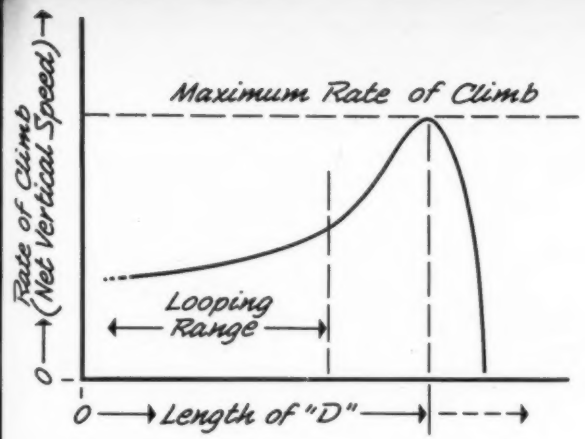
The modeler's problem is to change or vary D in small amounts until he finds the distance which produces maximum climb (or duration). Obviously, whenever D is changed the gliding trim is upset and the stabilizer incidence must be readjusted to correct the glide. How is D changed?

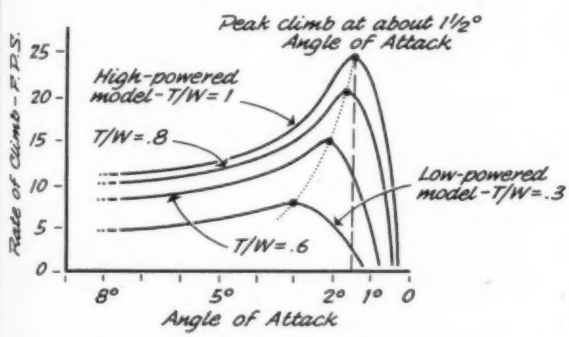
The distance D is changed by moving either the wing or the CG. If the wing is moved forward D is made larger or longer. If the wing is moved aft D is made smaller or shorter. Naturally, this can be done only if the model has an easily moveable wing, such as a contest rubber job or something similar.

When the model has a fixed wing or one that cannot be moved much due to the fuselage design, D is changed by moving the CG. Moving the CG aft makes D longer; moving the CG forward makes D shorter. The CG is moved by adding weight to the nose or tail end of the fuselage. Adding weight at the nose moves the CG forward (the same affect also comes from removing weight from the tail). Adding weight at the tail (on removing it from the nose) moves the CG aft. It is important to be able to move the wing or CG in small amounts. This means being able to add small weights and to measure carefully how far the CG shifts. Ordinarily, in the following procedure it is not advisable to change D by more than ¼inch at a time and, when getting to the critical part of the adjustment, changes as small as 1/64 of an inch can be critical in the case of the smaller models with lots of power. After the modeler has used the procedure several times he will develop a feel as to how much variation in D is necessary when adjusting a new model.

Now consider the graph in Fig. 2. In this figure the graph


Add positive incidence to stabilizer to correct stall
Start with "D" equalling 50 % of wing chord, trim for smooth glide
Add negative incidence to stabilizer to correct dive



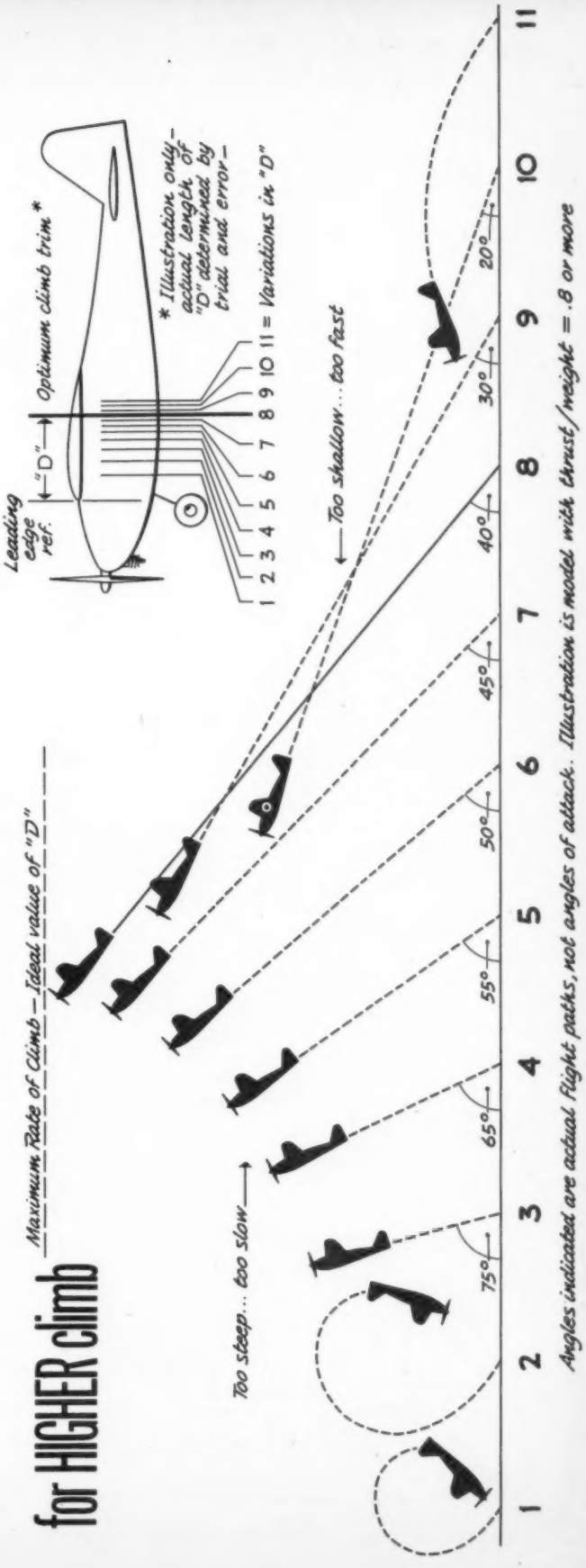


shows, for a typical model, how rate of climb (and therefore duration) varies with, or depends upon, the distance D.

For a typical high-powered gas model the rate of climb varies with D somewhat as shown in the figure. As D is made longer the climb slowly gets better until at some length it goes up fast and reaches a peak or maximum value. Then if D is made still longer the rate of climb will drop off quite rapidly until at some longer value of D the model will not climb at all and the rate of climb drops off to zero. The problem is to find by flight tests on the field, by moving the wing or CG (or both), the distance which makes the model fly at its maximum rate of climb.

The shape of the curve is helpful to us in that it shows that, when the model is not properly adjusted (D is not at its best length), the climb will suffer considerably. This is important for the model may appear to have a very good steady climb while actually it is considerably less than best. The maximum rate of climb is the one which will get the model up the highest. It is practically never the steepest climb. Rather, it is usually considerably less than the steepest climb the model can produce, as far as the angle of climb is concerned.

Another interesting point is indicated on the graph. When the distance D is quite a bit too short the model will have rather severe looping tendencies. Practically all modelers are aware of this undesirable looping trouble. Usually, they desperately add downthrust or put lots of spiral in the climb to prevent it. The unforunate thing is that, although this does prevent the looping, the model is still flying at a rate of climb considerably less than the best and due to the spiral flight path the climb suffers even more. If D is not so short as to cause looping it may still be short enough to cause the model to hang on the prop or climb too steeply—in either event the rate of climb as shown by the graph is not the peak or maximum rate. Again let us stress that the correct value of D which produces the best climb can only be found by numerous flights and observations. It takes lots of time and patience and sweat but it is really the (*Continued on page 40*)

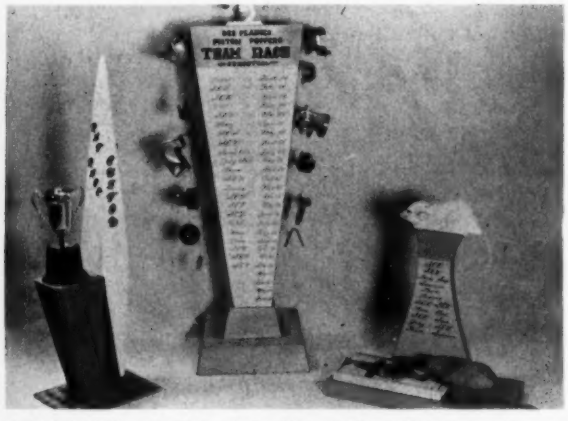


RAT RACING

Simplicity and excitement are making "poor man's team racing" a popular event. But to hold its ground, rat racing must have both custom, stock categories.

Candid look at an actual rat race in progress. Janet Eden, Greg Schibach and Dave Eden, cigar forgotten, going round and round.

And away we go! Janet holds the SEV Special (see opposite page). Plane on ground is Quicker Combat. Top displacement is .36 cu. in.



Trophies? Junk perpetual of Des Plaines Piston Poppers, center, requires each winner to add a memento. On right—how about that!

Holding the SEV Custom Rat Racer is Dave Eden (maybe the cigar is carved balsa?) while Herb Swanson flips the prop. Optional gear.

by R. J. VAN DEN BERG

► Despite abundant kits and building materials, group or club interest in modeling seems to be waning. Why? Is it due to the want of a good group-type competition activity?

Just what is a group-type competition activity? The answer is simple. Consider the words group-type to describe a certain kind of event in which quite a number of the club members are participating at the same time as opposed to the individual event.

Analyze the various kinds of model flying, and you will find only three that can be considered group-type, namely: Combat, Team Racing and Rat Racing.

Combat offers a sort of "body-contact" type of competition which most club members take to eagerly when first starting. In time, however, combat flying starts to fall off due mainly to the constant need for repairing and building.

This leaves us with only two other kinds of group-type flying—Team Racing and Rat Racing. These are somewhat similar in that they both have heat races and a final race. Now, in these two events there are more persons participating at the same time than there is in any other modeling event.

How many persons as a minimum would be active in these racing-type events? Assume four planes simultaneously flown. For ideal racing (*Continued on page* 50)

If you can't beat 100 mph, you are not in this league. SEV is fast, rugged, easily handled. Ship pictured is sixth in development series. In three club races, the SEV 3 averaged 104.4.

SEV custom rat racer

By SEV SPECIAL TEAM

► The year 1956 brought to the contest bugs an exciting new event, Rat Racing. Many of you know what Rat Racing is but, for those who are not quite sure, here is a rundown.

Rat Racing is supposed to be a poor man's (or lazy man's) answer to Team Racing. In Rat Racing the size, type and limits of the plane are very broad. In fact, there are practically no limits at all; whereas in Team Racing, there is a minimum wing area, fuselage height and width limit, maximum gas tank size, etc.

By now you'll be thinking that if you have a combat profile plane you can enter this "deuces wild" version of Team Racing. You are right! The only present restrictions are a maximum engine of .35 displacement and a landing gear.

Sounds easy! It is easy! But there is one thing we're overlooking. Rat Racing is flown like Team Racing, in that you compete against others at the same time. In the progression of heats up to the 'main-go', you've got to have a plane that will be better in the win (speed) bracket than the others in order to come out top dog.

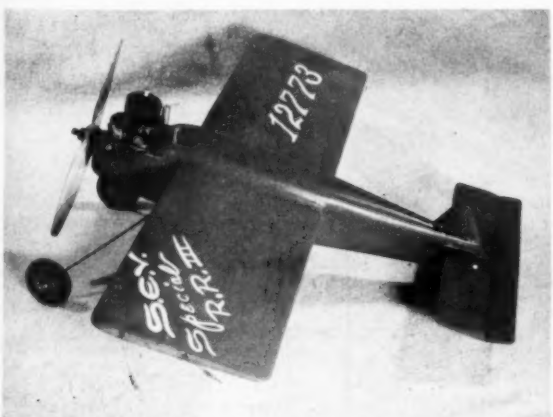
You'll say that's fine because you have two combat ships that are darn fast. How would they stand up against a real Rat Racer, a ship that has been designed especially for this new sport. Barring crack-ups to the competition, not so good. The average combat plane, though fast, is only doing about 80 mph. This isn't very much competition for a plane able to travel 100 mph or better.

The SEV Special Rat Racer fills the bill. It's small, fast, rugged and easily handled both on take-off and in the air. We will not go so far as to say that this is the ultimate in its design but it will certainly do until something better comes along.

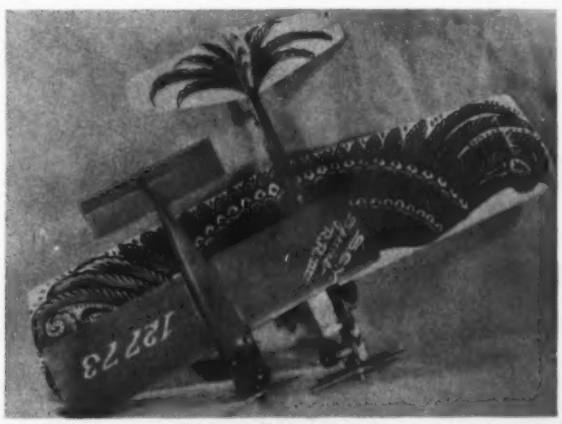
You can see from the pictures the ship is numbered III, but actually it is the sixth in a series progressing up to this design. The first two in the series were small (15" fuselage), sleek profiles. The first was clobbered due to tail heaviness. The next one was somewhat acceptable, speeds averaging around 94 to 95 mph. This second profile in time proved somewhat impractical in that the wing had only the width of the profile fuselage to be glued to. Large fillets helped some but still there was the tendency of the wing to come loose.

We then decided to go into a box-construction fuselage with a low wing. This plane proved that, if you have a solid motor and wing mounting, even though you gain some weight, you can have a better transmission of motor power. The average top speed jumped to 98 mph. Incidentally, this was an average *(Continued on page 54)*

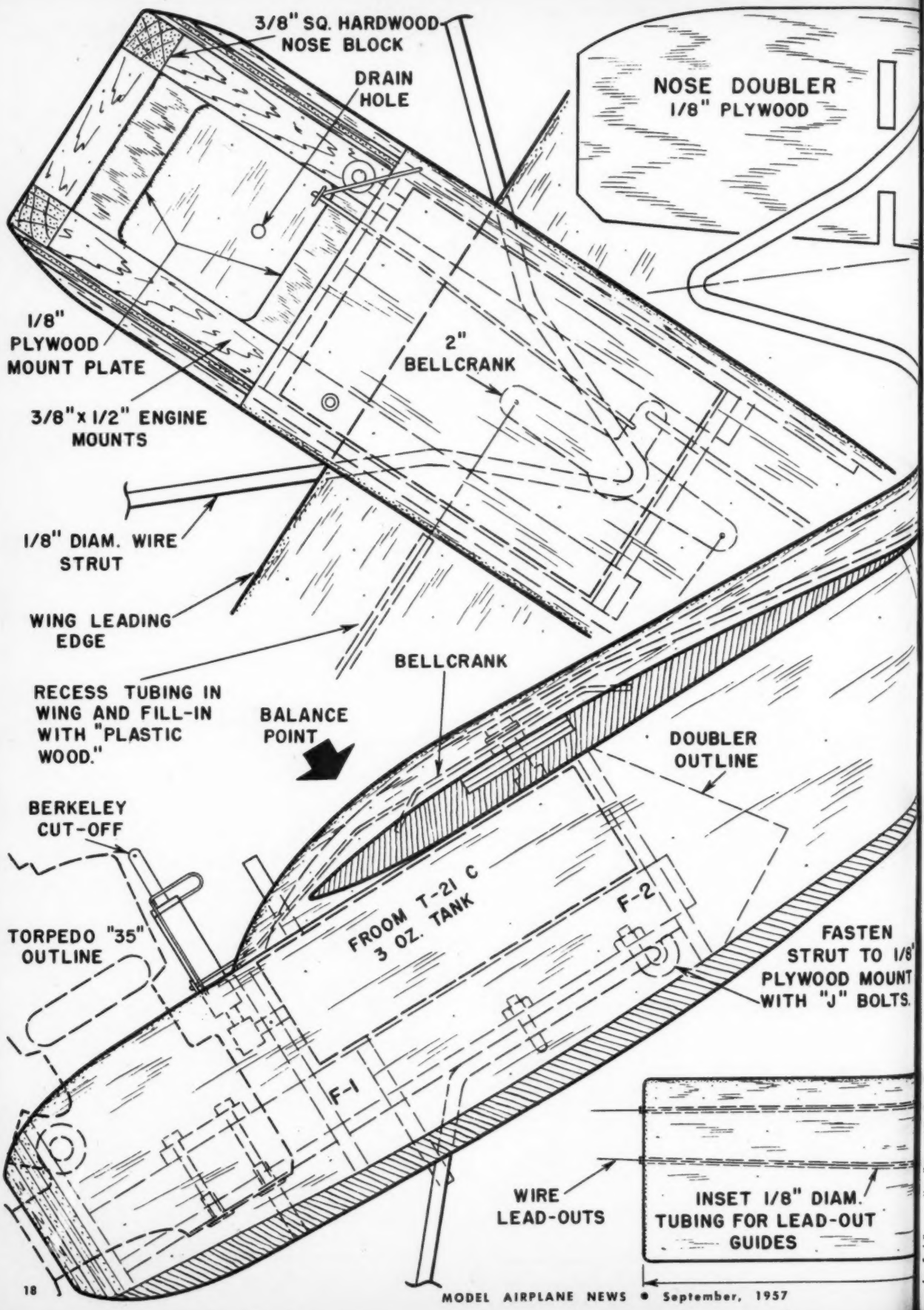
PLANS ON NEXT TWO PAGES

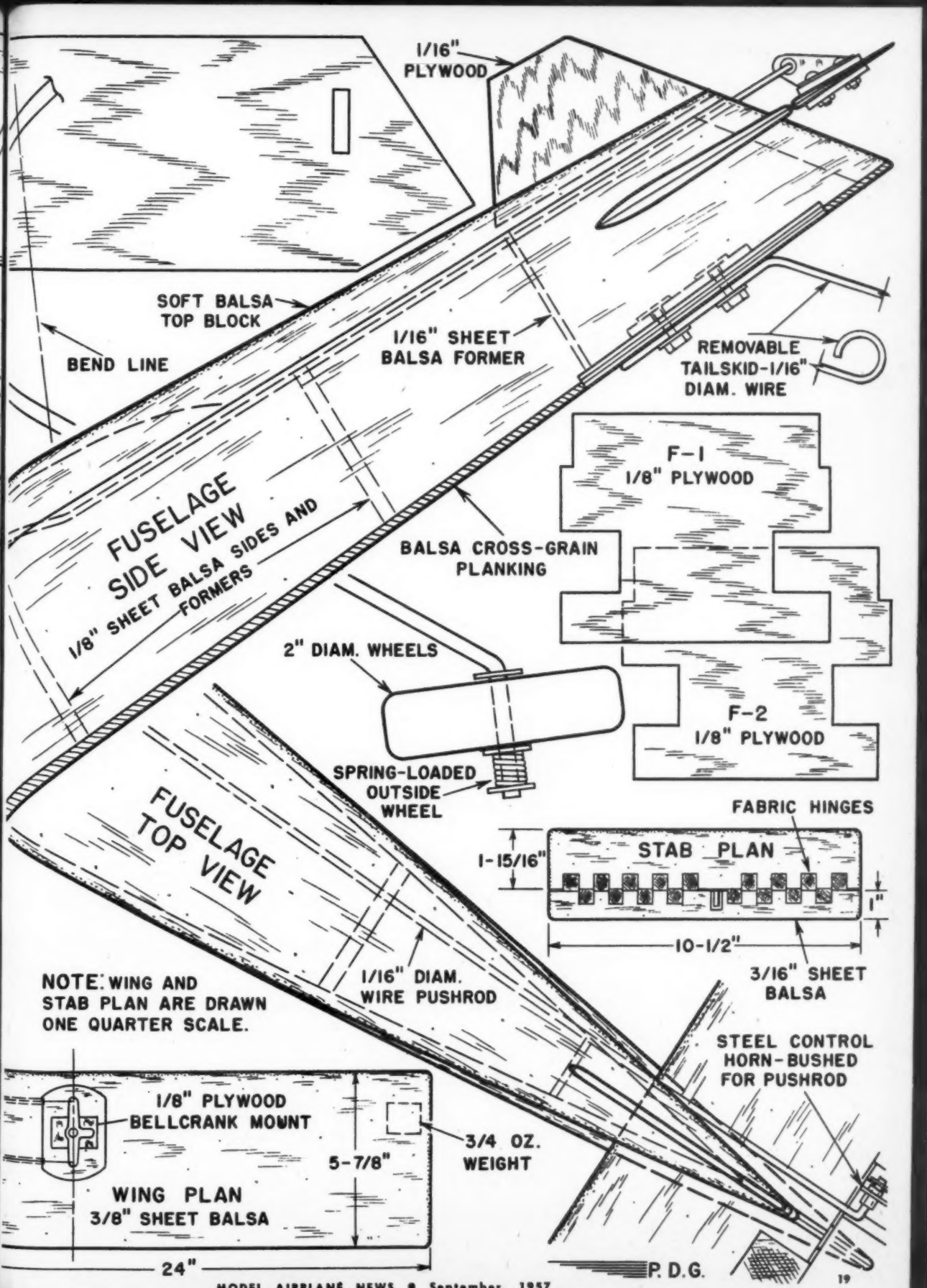


A "solid" front end lets the Torp .35 develop its full power all the time. Although these hornets are well built, hold down paint.



Beauty and the beast. Functional, stumpy SEV 3 makes interesting contrast to standard stunter—the gay bird design by Janet Eden.


3/8" SQ. HARDWOOD NOSE BLOCK
DRAIN HOLE
NOSE DOUBLER 1/8" PLYWOOD
1/8" PLYWOOD MOUNT PLATE
2" BELLCRANK
3/8" x 1/2" ENGINE MOUNTS
1/8" DIAM. WIRE STRUT
WING LEADING EDGE
RECESS TUBING IN WING AND FILL-IN WITH "PLASTIC WOOD."
BALANCE POINT
BELLCRANK
DOUBLER OUTLINE
BERKELEY CUT-OFF
TORPEDO "35" OUTLINE
FROM T-21 C 3 OZ. TANK
F-2
F-1
FASTEN STRUT TO 1/8" PLYWOOD MOUNT WITH "J" BOLTS.
WIRE LEAD-OUTS
INSET 1/8" DIAM. TUBING FOR LEAD-OUT GUIDES


1/16" PLYWOOD
SOFT BALSA TOP BLOCK
BEND LINE
1/16" SHEET BALSA FORMER
REMOVABLE TAILSKID-1/16" DIAM. WIRE
FUSELAGE SIDE VIEW
1/8" SHEET BALSA SIDES AND FORMERS
F-1
1/8" PLYWOOD
BALSA CROSS-GRAIN PLANKING
2" DIAM. WHEELS
F-2
1/8" PLYWOOD
SPRING-LOADED OUTSIDE WHEEL
FUSELAGE TOP VIEW
FABRIC HINGES
1-15/16"
STAB PLAN
1"
10-1/2"
3/16" SHEET BALSA
1/16" DIAM. WIRE PUSHROD
NOTE: WING AND STAB PLAN ARE DRAWN ONE QUARTER SCALE.
STEEL CONTROL HORN-BUSHED FOR PUSHROD
1/8" PLYWOOD BELLCRANK MOUNT
3/4 OZ. WEIGHT
5-7/8"
WING PLAN
3/8" SHEET BALSA
24"
P. D. G.

Getting away on a tow-launch, is American-style glider at a recent Nationals. The cloth tied to the towline helps release the line when plane is high overhead. Europeans are masters of tow.

Czepa on airfoils

PART TWO

by OSCAR CZEPA

► This article will concern itself with the knowledge gained about glider airfoils from the practical experiments of the so-called "Vienna School". In 1949, under the leadership of Erich Jedelsky, experiments with airfoils were begun in Vienna by a few model builders. The experiments were carried on outside, and the total areas of the models used ranged from 470 to 770 square inches—the sizes which are still most popular. In order to reduce to a minimum the influences of thermals, flights were made only late in the evening or early in the morning, and flights of particulary long or short duration were not considered in the calculation of averages. The gliders were towed by lines 18 meters long, which, added to the 2 meters height of the man, gave an altitude of about 61 feet. At first, experiments were begun with the MVA 227 (Diag. I), MVA 3o1 (Diag. II), and MVA 123 (Diag. III), airfoils described by Lippisch and the N-60 (Diag. IV), and Goett. 417a (Diag. V), airfoils on which measurements were made by F. W. Schmitz.

At first, the measurements were somewhat puzzling. For example, the curved plate Goettingen 417a was superior to others in calm weather, but suffered a considerable drop in performance when the wind increased. We found soon that the shape of the bottom of the airfoil was responsible. After this we were more careful and carried out tests both in calm and windy weather. In this way we could designate on the one hand an "ideal sinking speed" and, on the other, a "practical sinking speed". The latter was of interest for contest work.

The first tests indicated the following: MVA 227 was about as bad as N-60; the MVA 3o1 was better and the MVA 123 next best to the superior Goett. 417a. Next, MVA 123 was compared with Goett. 417 with a sharp trailing edge, and the Goett. 417a was better in calm air, but MVA 123 was superior in average performance during the day. In addition, the Goett. 417 (Diag. VI), was checked and this showed a small improvement in windy weather. These sections were on models of various size and wing loadings.

When the wing loading was less than that required by FAI rule. (3.93 ounces per square foot), the value of the turbulent boundary layer mentioned by Schmitz was particulary evident. With a wing loading half this high, the Goett. 417a was superior, because these models flew considerably slower. With

One-time stunt king, Jim Saftig, releases ship flown by a buddy during Californian Nationals.

Austrian team—author second from left—during a Nordic finals in Europe. Spindly proportions are efficient but do not always do so well when the weather is windy. The '56 winner a shocker!

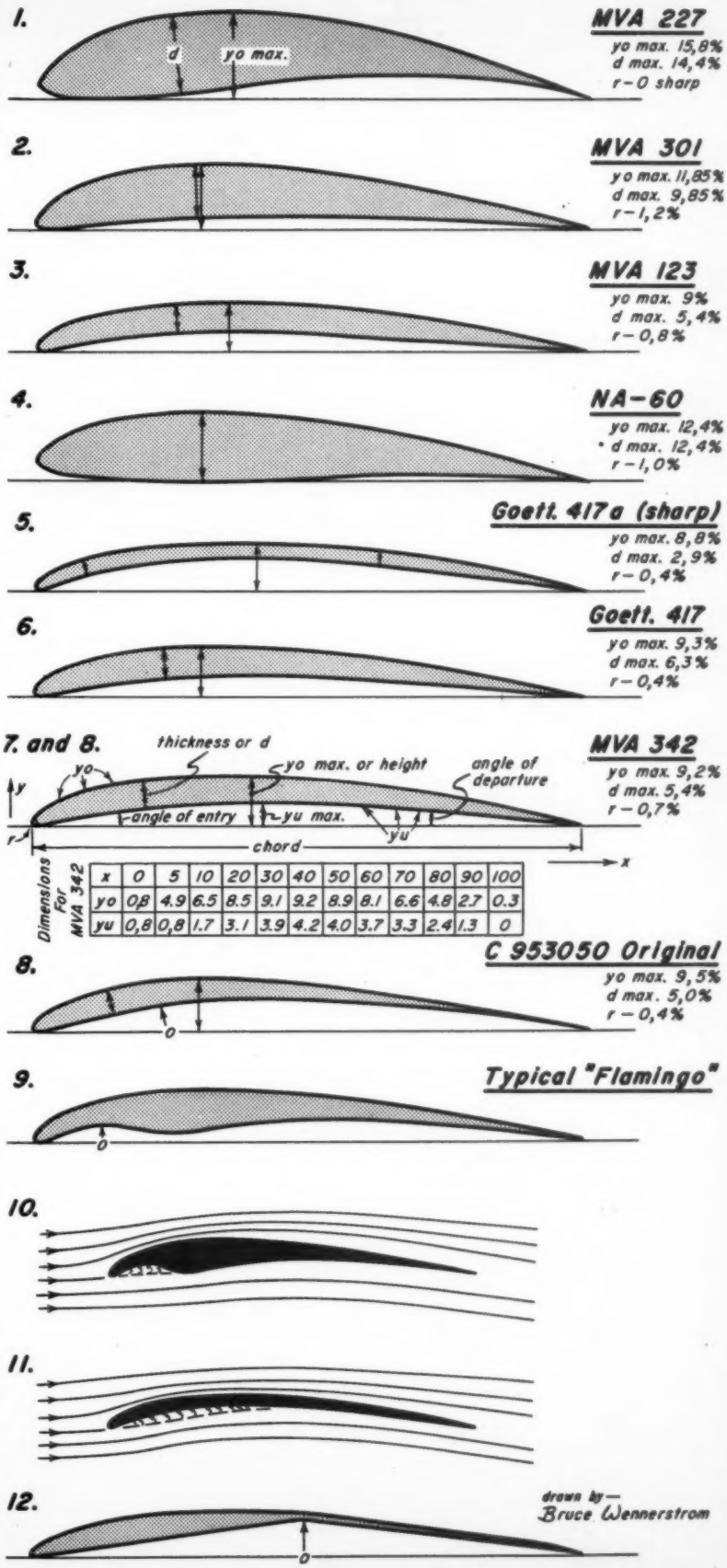
Zip-Zip airfoil proponents will be shocked, but when it comes to a high-performance glider, results have proved best the scientific approach.

the larger models, especially those approaching a total area of 2,000-square inches, airfoils similar to the MVA 301 were preferable. By this time enough sections had been tested that we felt capable of attempting the development of better airfoils. Pertinent questions were: What is the best shape of the upper surface? What is the best shape of the bottom surface? How should the nose of the airfoil be shaped, as well at its trailing edge portion?

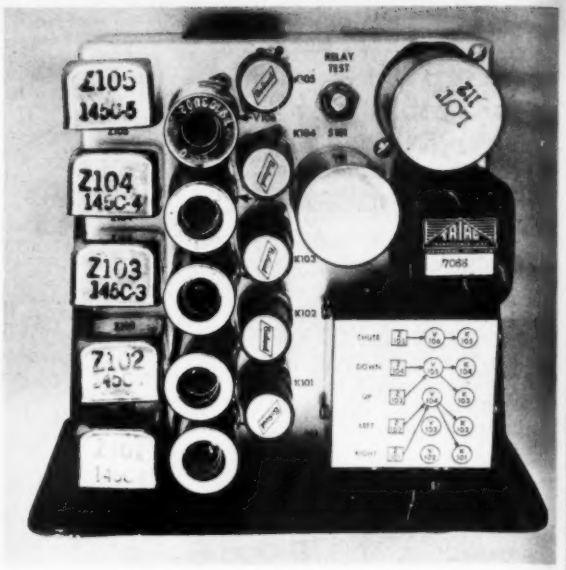
It was first necessary to find out how much camber of the upper and lower surfaces was possible, where the high points of both surfaces should lie, and what the form of the top and bottom should be leading to and from the maximum points. Finally, optimum angles of entering airstream and its leaving the trailing edge needed to be determined.

The primary step for drawing the series of airfoils was the determination of the crucial characteristics. These included: 1, the size of the nose radius; 2, the upper surface of the airfoil; 3, the lower surface of the airfoil; and, 4, the maximum thickness of the section itself. For drawing of airfoils, however, one limits himself to the x, yo, and yu values shown in illustration VII, which are given in percents and therefore can easily be altered for every desired airfoil thickness. The determination of the section's "mean camber" could be ignored, because we soon discovered that the relation of the upper surface to thickness was more important than the relation of the mean camber to thickness. To put it another way, two airfoils with identical mean cambers but different upper cambers showed considerable differences in performance.

With regard to the size of nose radius in order to achieve a turbulent boundary layer, the size given by Schmitz 0.4–0.8% of the chord for models of medium size—600 square inches—and low flying speed is sufficient. Explanation of the function of a sharp nose on an airfoil was explained in the previous article. The bottom of the nose area is blended gently into the underchamber in order to prevent the formation of agitated air on the bottom of the wing and assure laminar flow on it. Thin wings with sharp leading edges are not susceptible to (*Continued on page 46*)



Radio Control News



Five-channel Babcock receiver for drones has 100 mile range on a 12-Watt transmitter, 98% flight reliability, allowing all causes.

by E. J. LORENZ

Big city traffic light interference? Why, upstate New York they've even strapped receivers on goats! But the show goes on: beginner info, news, and developments.

CLUB NEWS

► Don't really know where this bit of information fits in, but this is the way Norm W. Davis of Dannsville, N.Y., explained it. RC has invaded the field of animal psychology. (Or is it psychiatry?) Anyway, they strap a small receiver (RK-61 two-tuber) to goats before they are let out to pasture. The receiver actuates a mechanism that gives them a mild shock and then their reactions are noted. It's legal and the goats don't mind! (Wait 'til the traffic lights comes on! –Ed.)

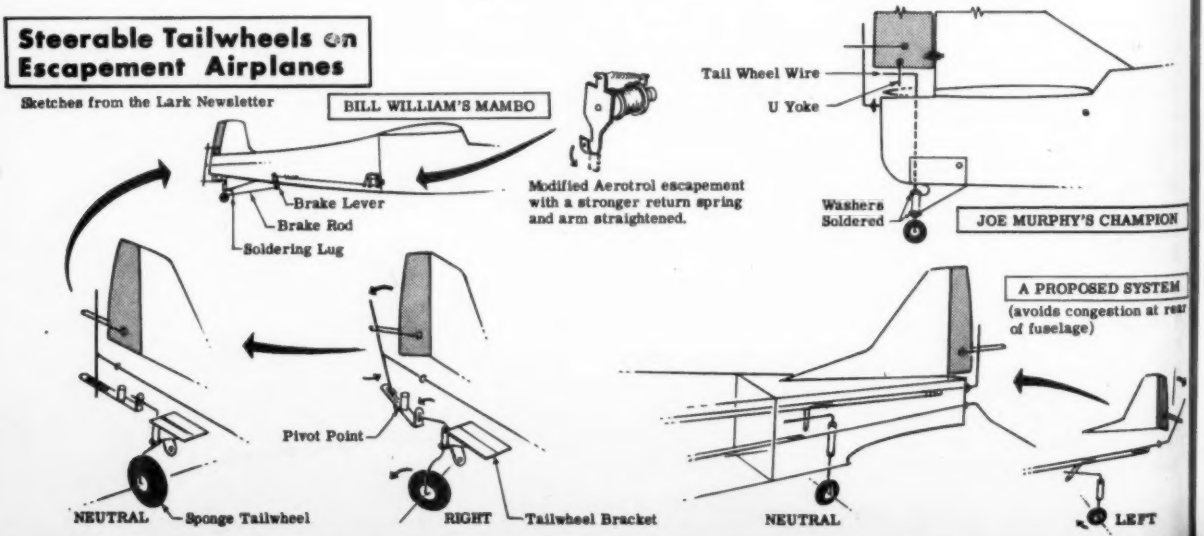
Plenty of activity in the Cornhusker State. The Omahawks, Omaha, Neb. are having their 3d annual two day RC contest on August 10th and 11th, at Benson Park in Omaha, AMA sanctioned for rudder only and multi-channel flying. In addition to trophies and prizes in each of the two main events, there will be special awards for the best finish, worst crack-up and spot landing. Photo shows a variety of kit-built planes, in addition to original designs, including a semi-scale Fokker D-8. What we weren't quite sure of, is what size wheels are used on the transmitter. For more information on this contest, contact Mr. Tom Mossman (seventh from the left), 1202 South 72nd Street, Omaha, Neb.

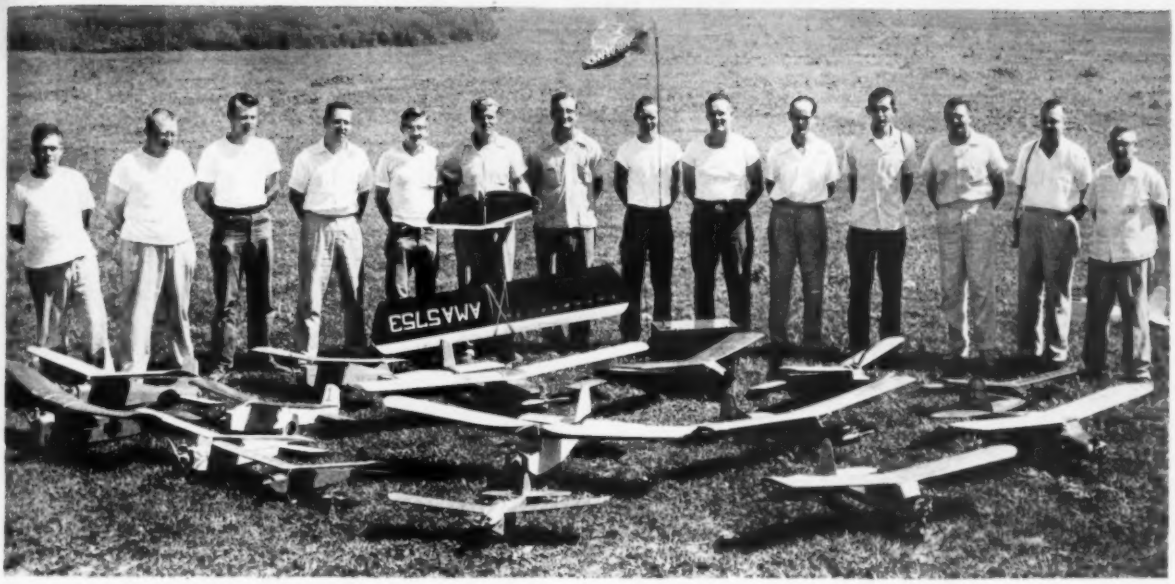
From Mr. Peter Dyer, Box 1632, Christchurch, New Zealand a picture of his Berkeley Sea-Cat, powered with an ED 2.46 diesel, about to rise up on the step. RC gear is by HMV of New Zealand and is equipment now sold by Serco Imports, 2759 E. 94th St. Seattle Wash,., The main feature of this receiver system is that the relay and actuator are combined, thus eliminating actuator batteries. Pete states that this ship his been flying very well for over two years and he manages to take it along on business trips, which just happen to be near a nice lake or beach.

Poughkeepsie, N.Y. became RC boat conscious. Many types of boats are run about once a week, including Kelly Day's submarine. Actually, Kelly does very well until he

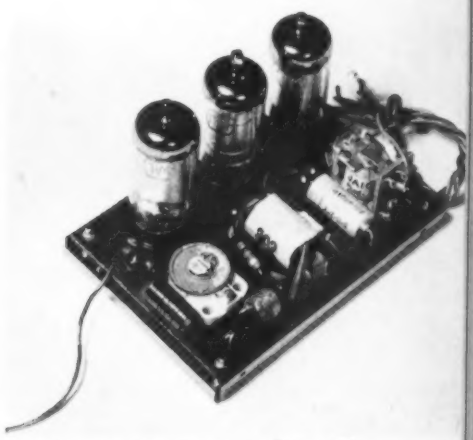
Steerable Tailwheels on Escapement Airplanes

Sketches from the Lark Newsletter





Variety pleases the Omahawks, of Omaha. Kit-built planes, originals, even a semi-scale Fokker D-8, are included in this picture. Club's third annual RC meet was scheduled for August 10-11. Prizes for worst crack-up, best finish, spot landings—rudder, multi events.



Bramco's new single-channel tone receiver, transmitter are shown, left, above. Protective can for receiver protects from shock, dirt. Center, above—Rear view transmitter with cover removed. Key interrupts carrier, tone. Right—Receiver, cover removed. Jaico relay.

tried backing up several times. With a low transom and full speed astern, the boat shipped enough water to go down stern first. We hope to present the RC system Kelly uses in the near future. He obtains semi-proportional left and right rudder, stop, full speed ahead and full or half speed astern, all from one single-channel receiver.

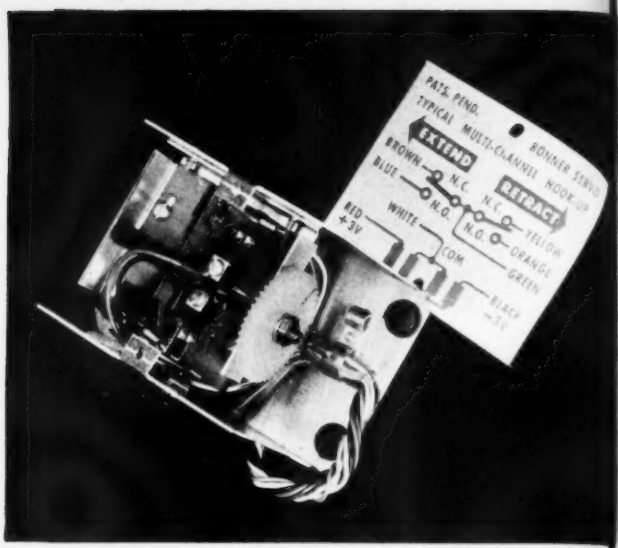
Have some limited details on a contest held May 26th, sponsored by the North Jersey RC Club at the Morristown Airport. In rudder only, K. Brennegan of Wilmington, Del. took first place with 59½ points. In single-channel flying, Bill Davis took first place with 111½ points (Bonner cascade escapements), followed by Bill Gilkey with 104½ points. The multi-channel event saw the perennial winner, Fran McElwee take first with his re-designed Robot and CG's 5-channel reed unit, scoring 124½ points. Second place went to his buddy Carl Schmaedig with his 5-channel CG equipped Smog Hog. Alex Rogutsky took 3rd place, also with a CG 5-channel unit. Art Grey took top honors in flying scale with his CG equipped J-3. Looks like the CG 5-channel reed equipment is really earning its salt. The entire club works with pulse, no escapements being used. Many famous names in this club, such as Foxworthy, McEntee, Leo Caniff, Vince Bonema and Herb Greenberg of indoor fame in the early 30's.

For Ford Motor Company RC fans who are unaware that their company is giving them a helping hand, contact Mr. Paul Cilia Jr., 5904 Ogden Avenue, Detroit, Michigan. So far, The Ford Electronic Tri-Modelers (plans, boats and cars) have over 25 members around Dearborn and the company has allotted a flying site one mile square, plus a pond about one acre in size. Membership is confined to employees of the Ford Motor Co. However, we're sure that considerable interest will be stimulated by this group to the point that other companies will follow suit.

By now you have heard that several well known American modelers made a tour of Africa, to demonstrate Radio Control and U-Control flying. Howard Bonner held them spellbound with his Smog Hog. Space does not permit a full rundown of all flying. However, it should be pointed

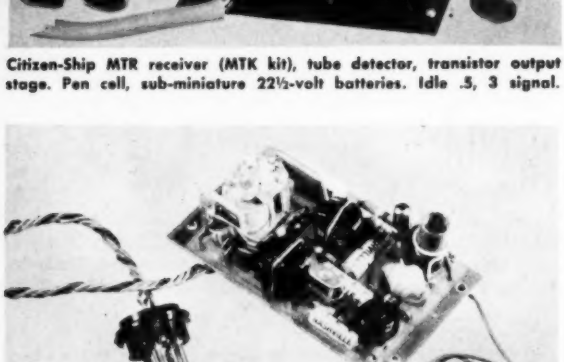
Continued on next two pages

Ken Willard rates his jobs by flying areas required, such as football field, tennis court size. This one-day balsa bipe quite small.



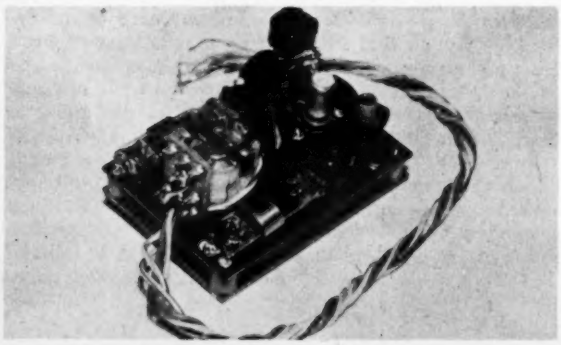
New Bonner servo is self-neutralizing, but adjustable neutral. Has printed circuit for sliding contacts. Note diagram on the cover.

Citizen-Ship MTR receiver (MTK kit), tube detector, transistor output stage. Pen cell, sub-miniature 22½-volt batteries. Idle .5, 3 signal.



CG Electronic single-channel tone receiver requires no filament batteries, 30-volt B supply. Uses 95-100% modulation, 300-600 cycles.

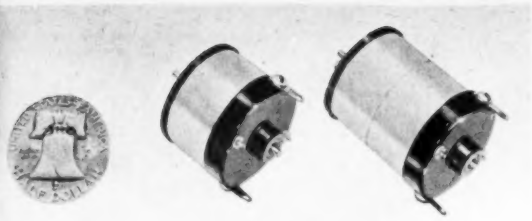
Essco twin hard-tube receiver. Two 1AG4 tubes draw only 80 mils. A single 22½ to 30V B battery sufficient. Selective, sharp tuning.



out that the reliability of equipment was such that NO flights were missed and the models were ready for any and all scheduled flights. Bonner was able to provide all the thrills of full scale aerobatics using CG five-channel equipment plus his regular line of escapements and new servos. To show you what a little advertising will do, there were times when there was a paid crowd of 6000. On the way home Bonner and Palmer, who did the U-Control flying, gave a demonstration on the estate of the Duke of Bedford, in London. For those of you wondering about shipping models around the world or around the country, these models were sent via regular airfreight on Sebena World Airlines, with nary a scratch.

The San Leandro Channel Masters have outlined a few rules for record attempts. The one that interests us most was the cross-country event. In essence, here are the rules! Point of take-off and landing must be clearly defined before take-off, and model must land within 100 meters of the designated landing point. Point-to-point flights will be measured in a straight line, using Sectional Aeronautical Charts. Take-off must be unassisted ROG and the initial record attempt must be at least 3 miles. Record attempts up to 10 miles must exceed the standing record by 1 mile and attempts over 10 miles must exceed the standing record by 10%. Control during the flight must be maintained by the contestant, unless circumstances deem otherwise. In this case the contest director shall be notified prior to the attempt. The one thing we like about this set of rules, is that there is no restriction as to the location of the transmitter during the flight. The FAI rules state that the transmitter must remain at one point throughout the flight. With the west coast rules we should see 10 mile flights before the end of this year.

From the Modulator, house organ of the Pioneer Radio Controllers of Calif., comes news that Alex Schneider did a rebuilding job on his plane after it landed in some high grass—which camouflaged a stack of cement blocks. Anyone for radar? Gordon Shepard of that group, ran into some bad luck which was traced to open connections inside his B batteries. (Fairly common, this, so place batteries on and against foam—Ed.) Bill Butler of the LARKS is having excellent results with his Les Wright receiver and Relaytor and the Thermic 100 gliders are leading the pack for RC sailplane work. The Orbit 8-channel equipment is gaining in favor and a Great Lakes Trainer should be finished by now. This model was one of the most pop-



Miniature electric motor suitable for RC actuators? On left, .5 to 16V, 10 to 500 ma, no load; shaft speed 800-20,000 rpm. Minitone.

ular rubber-powered projects in the old days and this RC job would bring back fond memories to the old timers. Time and experience pays off as evidenced by Bob Guhl Sr., with 27 points, beating out Bob Guhl Jr. who had 6 points in the Mickey Mouse event in the spring.

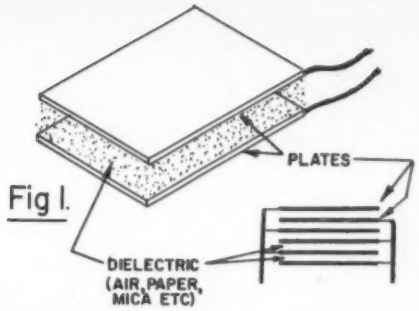
We would like to extend our thanks and appreciation to all clubs and groups who keep us up-to-date on their happenings. It is also noticed that certain clubs, such as Flying Bisons, and the Forest City Flyers of London, Ontario, Can. sent in contest announcements with standard road maps and commercial motel information. No trouble locating these contests!

TECHNICAL TOPICS

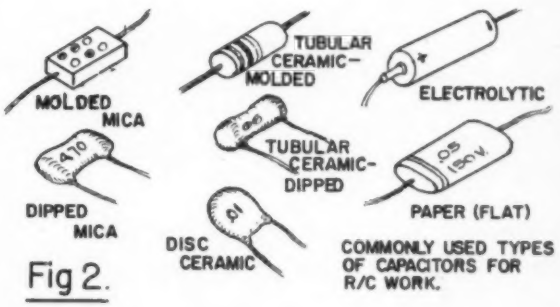
Last month we started a short series of discussions on components and how they function in a circuit. Resistors were covered, generally, and now we'll discuss briefly Ohm's Law and capacitors. Ohm's Law is used everyday in various RC calculations and may be stated that as one ampere of current flows through an ohm of resistance, a volt is lost. Or, a volt is required to push one ampere of current through an ohm of resistance, after which the volt is lost forever. Ohm's Law then states that current in amperes equals the electromotive force, in volts, divided by resistance in ohms.

The three basic ways of stating this law are; $I = E/R$; $E = I \times R$; $R = E/I$. For example, if we know the Voltage (E) and the resistance (R) we can find the current (I). A voltage of 3 volts and a resistance of 10 ohms will give a current of .3 amps or 300 ma. If we know the current flow is 50ma and the resistance is 30 ohms, then the voltage required to produce this flow is 1.5 volts. If the applied voltage is 3v and the current flow is 500ma, then the resistance of the circuit is 6 ohms. The above are all common RC problems you encounter everyday. Memorize the formulas and remember that the current in these formulas is given in amperes. Be sure to convert to milliamperes or vice versa.

Last month we told you that a resistor is a valve device for DC and most AC circuits. (*Continued on page* 57)



Illustrating beginner discussion, Fig. 1 shows basic design of a capacitor with two plates, but more, such as six, also may be used.



Capacitors come in many sizes, shapes, ratings, are marked or color-coded in various ways. Capacitors store electrical charge. Greek?

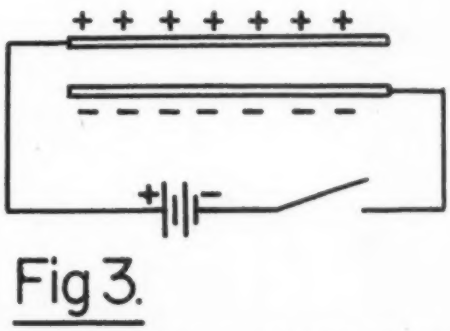


Fig. 3—When switch closed, flow ceases after charge between plates equals battery voltage. Capacitor shown connected to DC source.

Rising onto step is Sea Cat, built by Peter Dyer of Christ Church, New Zealand. Two years service on ED 2.46, and HMV radio. (Serco.)

FOKKER TRIPLANE by Joe Nieto. Plans of this famous World War 1 German fighter plane

ILLUSTRATED BELOW, IS THE PLANE FLOWN BY BARON MANFRED FR. VON RICHTHOFEN AS LATE AS APRIL 20, 1918. ON THAT DAY, HIS COMBAT REPORTS STATE HE SHOT DOWN TWO ALLIED PLANES WITH THIS MACHINE. THIS PLANE WAS PURE RED, LESS SQUARES & RUDDER Nº 1729 SHOWN HERE ONLY FOR ADDED ILLUSTRATION PURPOSES) WHILE THE STRAIGHT (LATIN) CROSSES, ADOPTED APRIL 1, 1918, WERE BLACK, WITH A VERY THIN WHITE OUTLINE AGAINST THE RED BACKGROUND. (NOTE: VARIOUS SOURCES DIFFER AS TO DATE OF CHANGE OF PATEE TO LATIN CROSSES. VARIATIONS FROM JAN. 1, APRIL 1, TO JUNE 1, 1918.)

Fokker DR.I 425/17

RICHTHOFEN WAS KILLED IN A PURE RED FOKKER DR-1 WITH STRAIGHT (LATIN) CROSSES, WITH VERY NARROW, IF ANY WHITE OUTLINES. THIS WAS A NEW DR-1, FROM THE FACTORY AT OBERURSEL, NEAR FRANKFORT AM MAIN. THE SERIAL NUMBER WAS 2009/17. REF: "DEUTSCHLANDS ZUKUNFT LIEGT IN DER LUFT" Pp. 21, & "JAGD IN FLANDERNS HIMMEL". (NOTE: THE ALBATROS D-3 USED BY RICHTHOFEN, WAS ALSO ALL RED, WITH BLACK CROSSES & NO WHITE OUTLINE)

ANOTHER POPULAR, BUT ERRING BELIEF WAS THAT RICHTHOFEN MADE A NORMAL THREE-POINT LANDING WHEN SHOT DOWN BY A. ROY BROWN. RICHTHOFEN'S TRIPLANE, WAS ACTUALLY CRASHED. THE PLANE WAS DEMOLISHED BEYOND THE COCKPIT. THE SOUVENIR-MINDED AUSY SOLDIERS DID THE REST.

(VON RICHTHOFEN ALSO TORED OUT THE PYM'Z DR.1 TRIPLANE.)

OVERALL LENGTH. 19'-0"

SHOWN BELOW, IS THE FIRST FOKKER DR-1 TRIPLANE POSSESSED AND FLOWN IN COMBAT BY BARON MANFRED FREIHERR VON RICHTHOFEN, GERMANY'S GREATEST WORLD WAR I ACE, COMMANDER OF JAGDSTAFFEL 11, WITH 80 OFFICIAL AND 126 UNOFFICIAL VICTORIES TO HIS CREDIT. BEFORE HE WAS SHOT DOWN NEAR SAILLY LE SEC, NORTH OF VAUX SUR SOMME, ON APRIL 21, 1918, BY CAPTAIN A. ROY BROWN, D.S.C., OF Nº 209 SQUADRON, ROYAL AIR FORCE.

Fok.F1 102/17

IT HAS BEEN GENERALLY PUBLICIZED THROUGHOUT THE PAST, THAT VON RICHTHOFEN WAS SHOT DOWN IN A FOCKER DR-1, SERIAL Nº F1. 102/17. THIS WAS DEFINITELY NOT TRUE. VON RICHTHOFEN, LIKE RAOUL LUFBERY, EDDIE RICKENBACKER, AND MANY OTHER FAMOUS ACES OF THAT TIME, DID NOT CONFINE THEIR COMBAT FLYING TO THE USE OF ONE SAME, PERSONAL PLANE CONTINUOUSLY. RICKENBACKER, USED TWO IDENTICAL SPAD "Nº 1's", IMMELMANN ALSO USED THIS TRICK WITH "E TYPE FOKKERS. LIKEWISE, RICHTHOFEN FLEW FOUR OR MORE DR-1's INTERMITTENTLY, BUT RESERVED HIS 102/17 FOR OFFICIAL VISITS TO THE OTHER STAFFELS UNDER HIS WING, AND OCCASIONAL TRIPS TO THE FOKKER FACTORY. AT LEFT, IS SHOWN ANOTHER OF THE FOUR DR-1's MANFRED USED, AND THE FOURTH, IDENTIFIED AS THE ONE IN WHICH THE FAMED RED KNIGHT OF GERMANY MET HIS DEATH. MANFRED'S SECOND TRIPLANE WAS FOK.1.152/17.

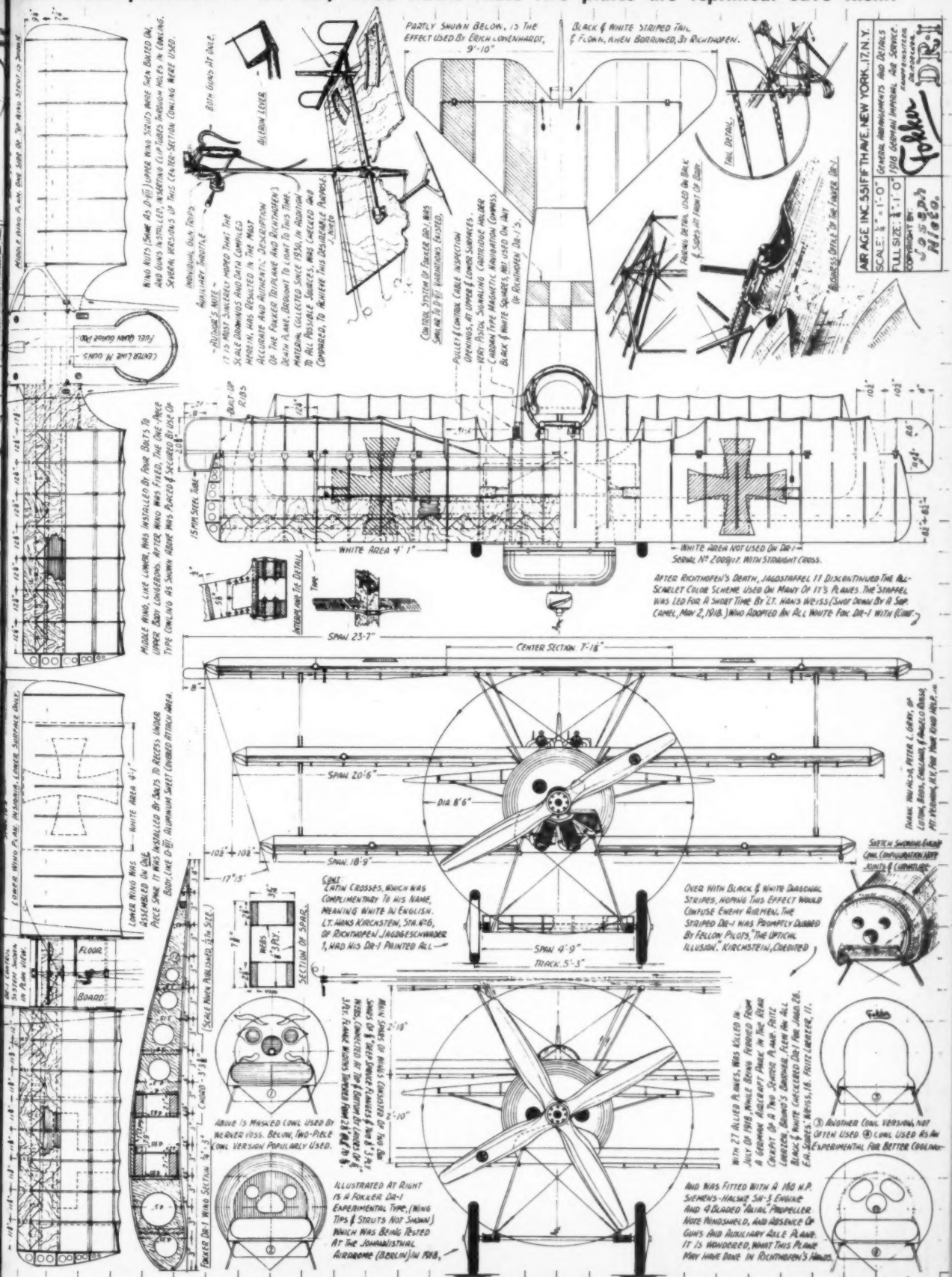
MACHINE GUN DETAILS ON MY FOKKER D-VII DRAWINGS ARE IN ERROR. CORRECT SYSTEM SHOWN HERE, FITS D-VII. LINE AMMO ENTERS GUN FROM RIGHT SIDE & REAR TANK. CLIPS DISCHARGED THRU TUBE AT LEFT. EACH GUN, TO FRONT TANK. USED SHELLS DISCHARGED OUT RIGHT OF GUNS INTO THE AIR.

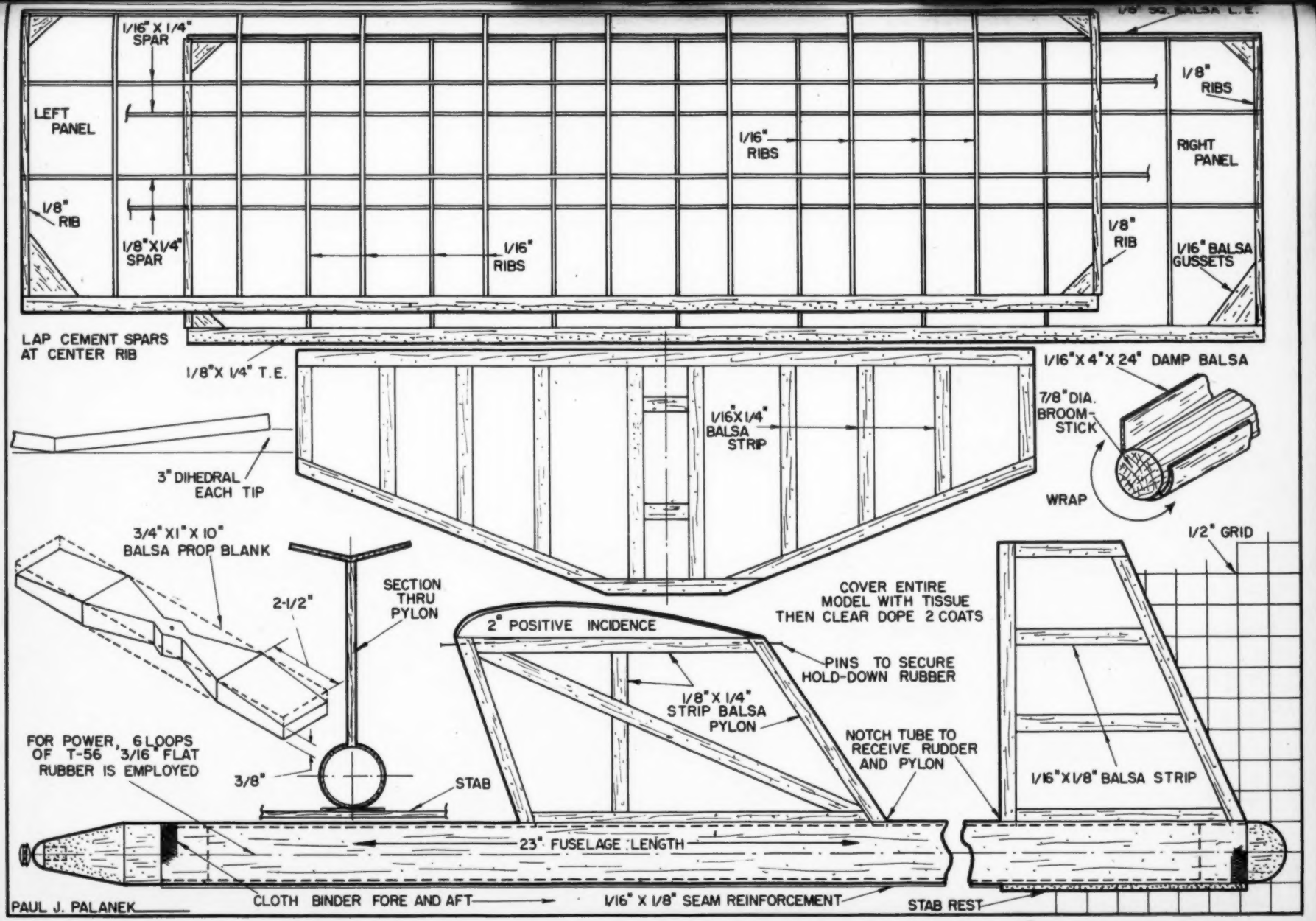
ENGINE SHOWN ABOVE IS THE 110 HP. LE RHONE. RICHTHOFEN WAS SUPPOSED TO HAVE USED SUCH A CAPTURED ENGINE IN HIS SHIP. THE GERMAN "OBERURSEL" WAS COPIED FROM THE 110 LE RHONE. WHEELS WERE 36 SPOKED, 18 SPOKES ON EACH WHEEL SIDE. SHOCK ABSORBER CORDS. OIL TANK FILL (4 GALS.) ENGINE COWL FASTENER.

GENERAL CHARACTERISTICAL DATA: WEIGHT EMPTY, 376 Kg. (829 LBS.) USEFUL LOAD, 195 Kg. (430 LB.) TOTAL WEIGHT, 571 Kg. (1260 LB.) TOTAL SPANS, 23'7", 20'6", 18'9" O.A. LENGTH, 19'0". MAX. HEIGHT: 9'9⅜". CHORD OF MAIN PLANES, 3'-3⅜". GAP BETWEEN PLANES, AS SHOWN. ANGLE OF STAGGER OF ALL THREE PLANES, 14°0. ANGLE OF INCIDENCE, UPPER, 2°@ C.C. 3°45'@ AILERONS, MIDDLE & LOWER WINGS, 1°30' INCIDENCE OF TAIL PLANE, 5° POS. TAIL PLANE SPAN, 9'-10". ENGINE, 110 HP. LE RHONE (FR.) OR OBERURSEL. (GER. COPY.) CONT: LOWER LEFT.

HATS OFF WITH THANKS TO: ROBERT E. LOOK, PITTSBURGH, PA. AND TO CAPTAIN KIMBROUGH S. BROWN, U.S.A.F., SURREY, ENG. FOR ASSISTS ON THESE DRAWINGS.

had been published in the July 1952 MAN. These two plates are reprinted. Save them!

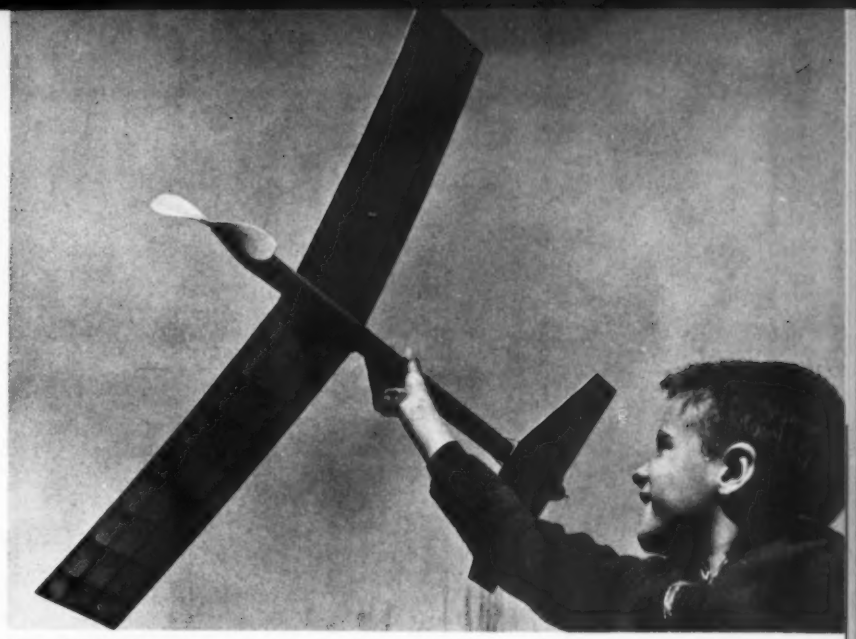

AIRAGE INC. 55 FIFTH AVE. NEW YORK, N.Y.
SCALE: ½" = 1'-0"
FULL SIZE: ½ = 1'-0"
GENERAL ARRANGEMENTS AND DETAILS
1918 GERMAN IMPERIAL AIR SERVICE
MANUFACTURED
Fokker DR.I
COPYRIGHT BY
Joseph Hieb
PARTLY SHOWN BELOW, IS THE EFFECT USED BY ERICH LOWENHARDT, 9'-10"
BLACK & WHITE STRIPED TAIL & FUSELAGE, WHEN BORROWED, BY RICHTHOFEN.
WING NUTS (SAME AS D-VII) UPPER WING STRUTS HAVE TWO BOLTED ON, AND GUNS INSTALLED, INSERTING CLIP TUBES THROUGH HOLES IN COWLING. SEVERAL VERSIONS OF THIS CENTER-SECTION COWLING WERE USED.
AILERON LEVER
BOTH GUNS AT ONCE.
AUXILIARY THROTTLE
INDIVIDUAL GUN TRIPS
~RUDOLF'S NOTE~ IT IS MOST SINCERELY HOPED THAT THE SCALE DRAWINGS AND DATA COMPILED HEREIN, HAS RESULTED IN THE MOST ACCURATE AND AUTHENTIC DESCRIPTION OF THE FOKKER TRIPLANE AND RICHTHOFEN'S DEATH PLANE, BROUGHT TO LIGHT TO THIS TIME. MATERIAL COLLECTED SINCE 1930, IN ADDITION TO ALL POSSIBLE SOURCES, WAS CHECKED AND CROSS-CHECKED, TO ACHIEVE THIS DESIRABLE PURPOSE. -JOSEPH
CONTROL SYSTEM OF FOKKER DR.I WAS SAME AS D-VII VIBRATIONS EXISTED.
PULLEY & CONTROL CABLE INSPECTION OPENINGS, AT UPPER & LOWER SURFACES.
VERY PISTOL SIGNALING CARTRIDGE HOLDER
CARDAN TYPE MAGNETIC NAVIGATION COMPASS.
BLACK & WHITE SQUARES, NOT USED ON ANY OF RICHTHOFEN DR.I'S.
FRONT DETAIL, USED ON BACK (SLOPES AT FRONT OF BODY)
SIDE DETAIL
BUSINESS OFFICE OF THE FOKKER DR.I
FULL GUN CHUTE PAD
(CENTER LINE MOUNTS)
BUILT UP RIBS
15/16 STEEL TUBE
WHITE AREA 4'-1"
WHITE AREA NOT USED ON DR-I SERIAL NO. 2009/17. WITH STRAIGHT CROSS.
AFTER RICHTHOFEN'S DEATH, JAGDSTAFFEL 11 DISCONTINUED THE ALL-SCARLET COLOR SCHEME USED ON MANY OF IT'S PLANES. THE STAFFEL WAS LED FOR A SHORT TIME BY LT. HANS WEISS (SHOT DOWN BY A SOP. CAMEL, MAY 2, 1918.) WHO ADOPTED AN ALL WHITE FOK. DR-1 WITH (LONG)
INTERIOR SIDE DETAIL
TOP
MIDDLE WING, LIKE LOWER, WAS INSTALLED BY FOUR BOLTS TO UPPER BODY LONGERONS. AFTER WING WAS FITTED, THE ONE-PIECE TYPE COWLING AS SHOWN ABOVE WAS PLACED & SECURED BY USE OF
SPAN 23'-7"
CENTER SECTION 7'-1⅝"
SPAN 20'-6"
DIA. 8'-6"
SPAN 18'-9"
SPAN 9'-9"
TRACK 5'-3"
LOWER WING WAS ASSEMBLED ON ONE PIECE SPAR. IT WAS INSTALLED BY BOLTS TO RECESS UNDER BODY. LIKE D-VII. ALUMINUM SHEET COVERED ATTACH AREA.
LOWER WING PLAN, INSIDE, LOWER SURFACE SHOWN
WHITE AREA 4'-1"
FLOOR
BOARD
SECTION OF SPAR.
WEB
FOKKER DR.I WING SECTION
(SCALE WHEN PUBLISHED 3" IN SIZE)
CHORD 3'-1⅜"
SPAR
SPAR
SPAR


1/16" X 1/4" SPAR
LEFT PANEL
1/8" RIB
1/8"X1/4" SPAR
1/16" RIBS
1/16" RIBS
1/8" RIBS
RIGHT PANEL
1/8" RIB
1/16" BALSA GUSSETS
LAP CEMENT SPARS AT CENTER RIB
1/8"X 1/4" T.E.
1/16"X 4"X 24" DAMP BALSA
7/8" DIA. BROOM-STICK
WRAP
1/16"X1/4" BALSA STRIP
3" DIHEDRAL EACH TIP
3/4"X1"X 10" BALSA PROP BLANK
2-1/2"
SECTION THRU PYLON
1/2" GRID
COVER ENTIRE MODEL WITH TISSUE THEN CLEAR DOPE 2 COATS
2° POSITIVE INCIDENCE
PINS TO SECURE HOLD-DOWN RUBBER
1/8"X 1/4" STRIP BALSA PYLON
NOTCH TUBE TO RECEIVE RUDDER AND PYLON
FOR POWER, 6 LOOPS OF T-56 3/16" FLAT RUBBER IS EMPLOYED
3/8"
STAB
1/16"X1/8" BALSA STRIP
23" FUSELAGE LENGTH
CLOTH BINDER FORE AND AFT
1/16" X 1/8" SEAM REINFORCEMENT
STAB REST
PAUL J. PALANEK

big inch

by PAUL J. PALANEK

Something different in rubber jobs, a tricky looking sport flier with a parasol wing, and concealed rubber.



Big and light, Silkspan-covered rubber model is big thrill after all those little all-balsa fliers. Plans are half size but, ye gods, men, if you can draw a fence you make layout.

By stretch winding rubber, duration greatly increased. Helper later held prop at hub to take pull as poppa backed away, began winding.

Good enough flights can be made by hand winding, however. Try hobby shop machine-cut prop blank, Paulownia props. No gut—needle!

► These days there appears to be a deluge of channel chatter, and souped-up gas burners. It is a good time to think of a change-of-pace model. Here is our suggestion: A rubber-powered stick, with free flight gas lines. A guaranteed flier, a snap to build, and no snapped props. The Big Inch was designed with simplicity in mind, to favor the beginner, and was given lines to entice the experienced to try their hands at what they have almost forgotten—a rubber model.

The landing gear is eliminated, since there is little need of it in this sport flier. Hand launching is simple, efficient, and quick. For a rapid rewind of the rubber motor, the flier should make use of a hand drill; this will save wear and tear of the index finger. A Paulownia ten-inch prop (badger your dealer—also America's Hobby Center, 25c) was used and found to be most efficient. We call it out because many a model's efficiency is lost with the carving of a prop. To the beginners we suggest the Paulownia; for the experienced a prop blank is given in the plans.

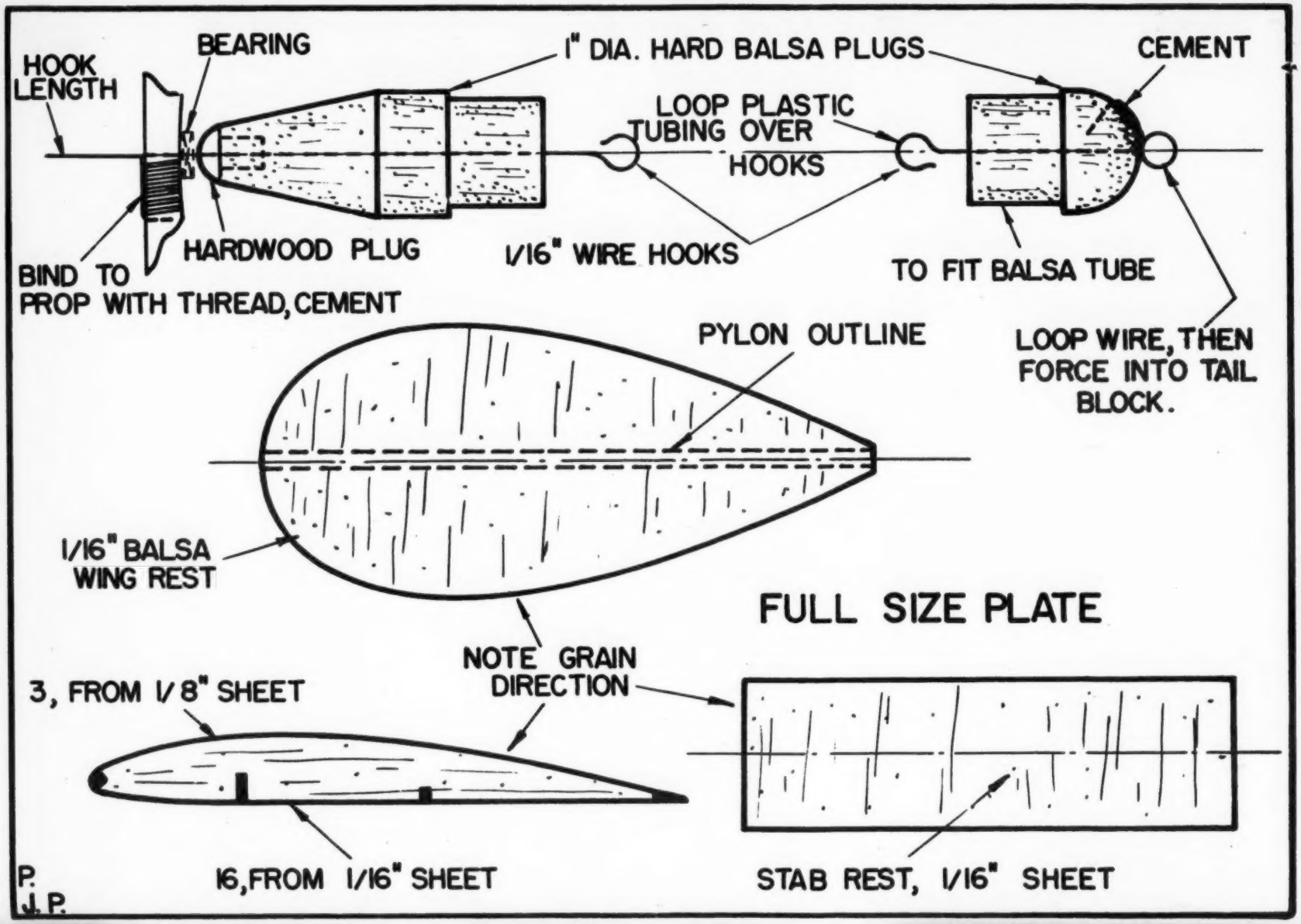
The wing plan employs a Clark Y cross-section which, of course, is the old standby. The wing is built ruggedly but is light of weight, as is the whole model. Big Inch sports 180 sq. in. of area with an all-up weight of 2½ ozs. With proper trim, the flights are sensational, logging from two to five minutes per launch, using maximum power.

Construction begins with the tubular fuselage; however, one plate of full-size plans is given; the half-size plan will need doubling. The finished stick measures one inch outside diameter with a 1/16" wall. Use a sheet of balsa, 1/16 x 3 x 27" long, soak in warm water for 20 minutes, then wrap around a 7/8" dia. broom handle. Secure with masking tape until completely dry. When dried, and still on the broom handle, put a razor cut through the overlap. This will give you an edge and, at the same time, a true circle. Cement the tube and reinforce with a strip of 1/16 x 1/8" balsa along the outer seam. Run a line of cement down the inner seam as well. Trim the ends to proper length.

The flat surfaces are next in line for attention. These are: rudder, elevator and pylon. All but the pylon are built up using 1/16 x 1/4" (*Continued on page* 53)

MORE PLANS ON NEXT PAGE

BIG INCH . . . Continued from preceding page.



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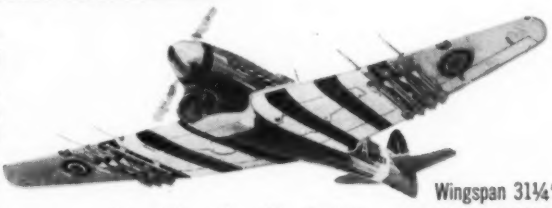

Wingspan 31¼"

for .09 .15 .19 **Engines** Overall length 22½"

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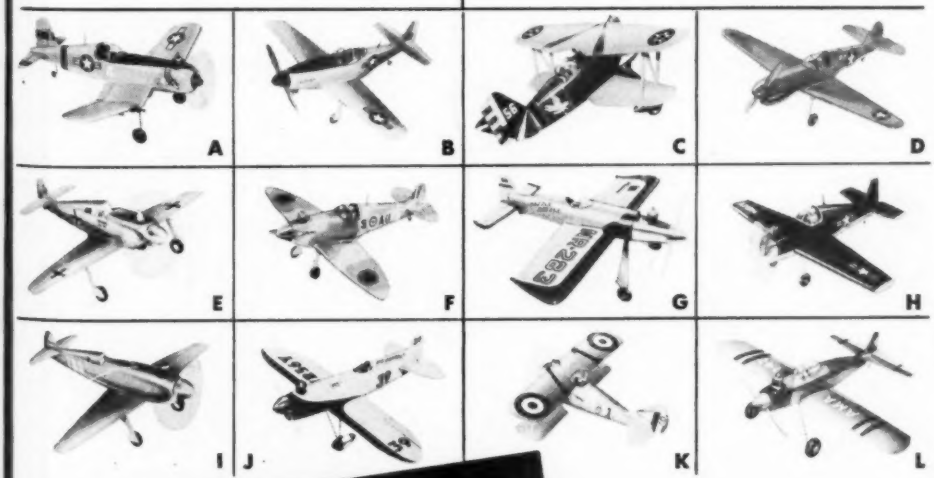

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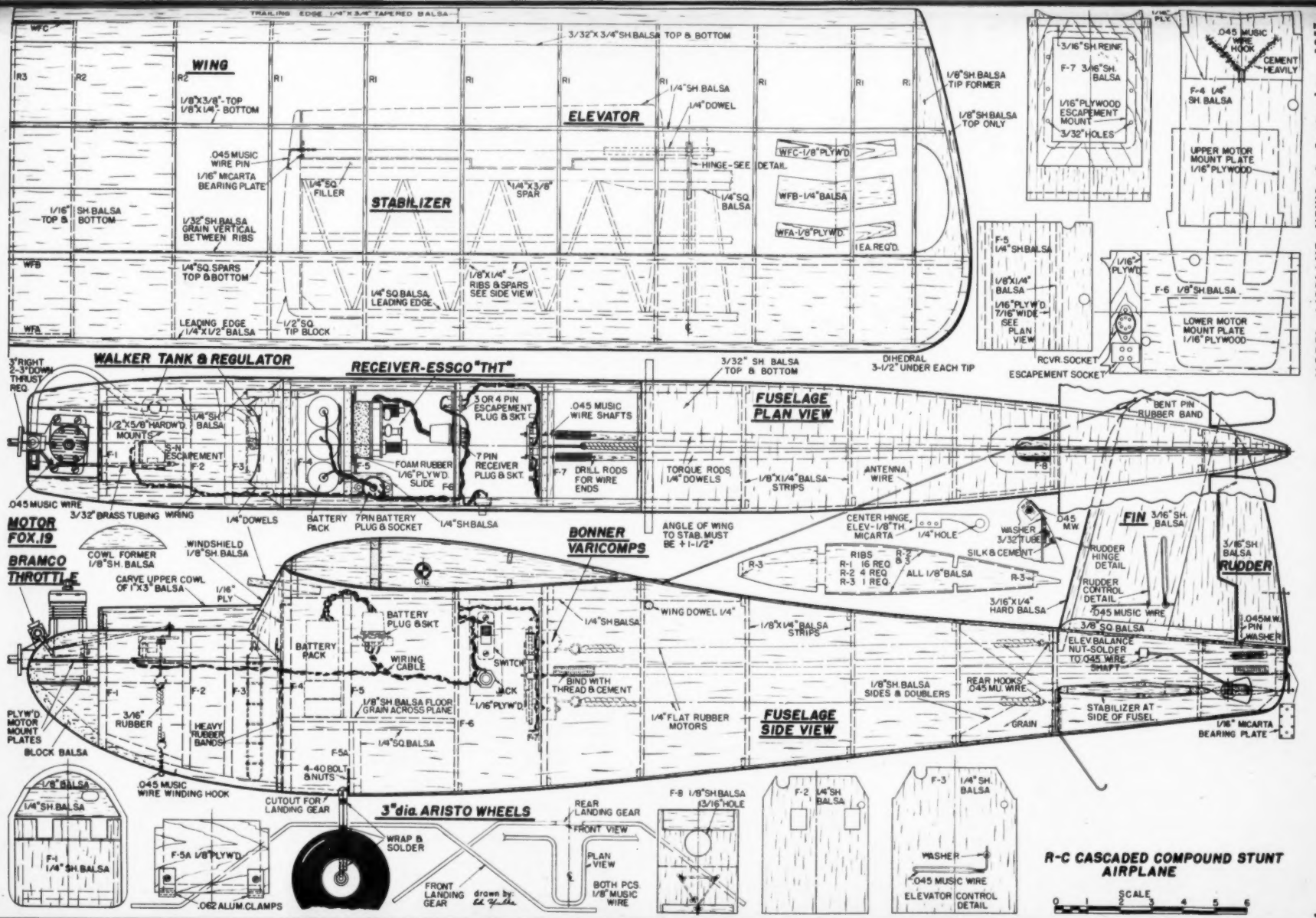


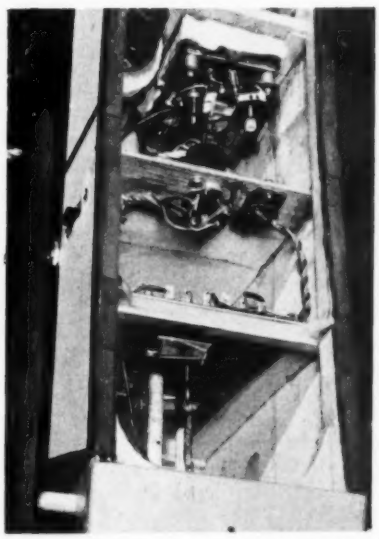
FULL SIZE PLANS AVAILABLE. SEE PAGE 56.

TRIPLE THREAT

Radio Control

Following popular practice, Triple Threat is easily built. A 15% thick wing, square cross-section prevent excessive dive speeds which interfere with outside loops. But climbs well.

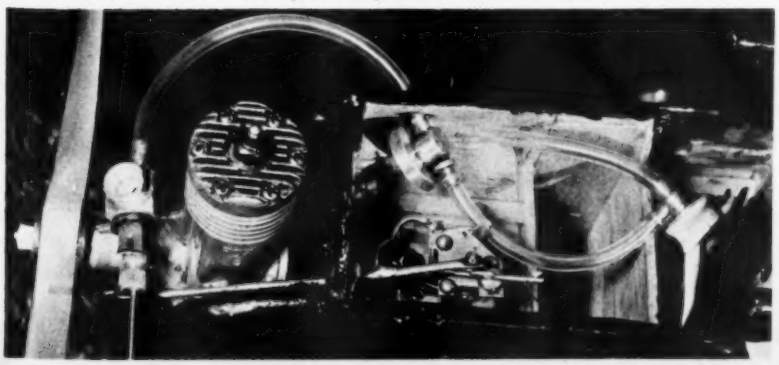
Twin hard-tube receiver mounts on foam rubber. Use Pliobond to attach foam to tray, receiver.



Cabin details, the receiver compartment and, to rear, escapement compartment. It's accessible!

Outside loops and other advanced maneuvers are easy with an escapement airplane. All you need is a good aircraft like this one. Developed for testing the VariComps or cascaded escapement deals, does well on rudder. Multi possibilities.

Bramco throttle, Fox .19, worked by SN escapement. Pressure tank (room for two) consistent.

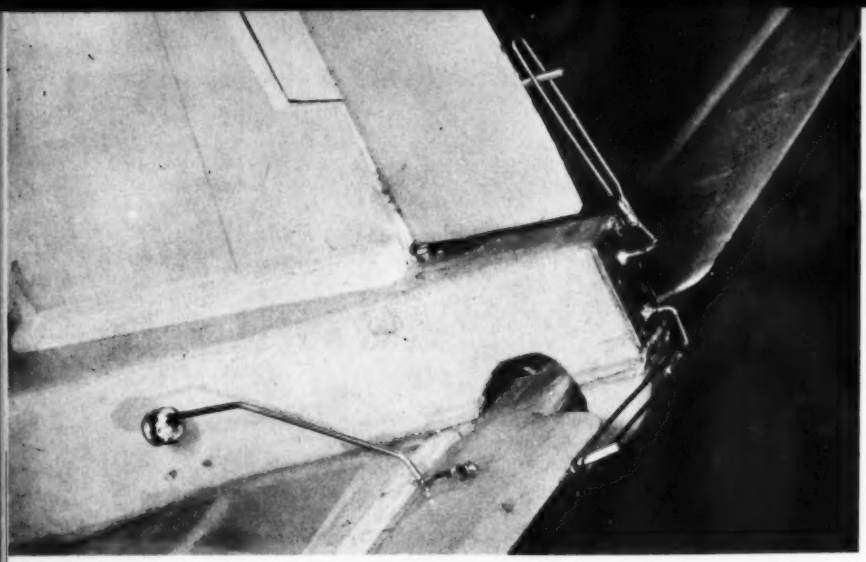


● Airplane designs truly qualified for rudder-only, cascaded escapements (Mickey Mouse), and multi-control can be counted on the thumbs of one hand. This one is outstanding as an all-purpose flier. Designed specifically for stunt on VariComp escapements—consecutive outsides and inside loops are easy, it maneuvers smoothly and easily on rudder and, with the addition of trim possible with multi-channel, would be capable of sustained inverted flight in addition to the outsides. On the VariComps, it demonstrated on 49 test flights (at time of writing) unusual possibilities as a basic, multi-class ship, assuming the necessary equipment substitutions.

Design: Good climb, moderate speed, relatively low dive speed, were required in a full-stunt machine of a size suited for escapements or servos. Five feet on a .19 is a reasonable maximum for an escapement airplane, yet is big enough for multi-channel and servos, with lightweight equipment. With heavy equipment and more than five channels, a larger aircraft would be required for top notch performance. But escapements can be marginal with big control surfaces and high air loads. Triple Threat has a 59-inch wing span with an 11 inch chord. A gross of less than four pounds gives 14 ounces wing loading and 326 ounces power loading.

Control System: Matched VariComps provide engine control through an SN escapement and Bramco throttle, on one quick blip; right rudder on one and hold, left on two and hold, up on three and hold, and down on four and hold. No timing problems occur with ¼ inch rubber escapement power with plenty of turns. Timing problems (wrong controls) exist when escapement speeds slow up—hence 3/16 inch rubber is advised against, or a low number of turns on any rubber. Engine control is really easy on lower escapement speeds, but then, fast signals for other controls frequently change engine speed. To save weight, 3/16 inch dowels were used at first with aerodynamically balanced elevators. Rudder

Continued on next page



Aft end, showing control surface drive linkage. In foreground, is mass balance on the elevator.

was sluggish, until aerodynamically balanced. Elevator was unreliable when rubber turns were expended until the mass balance was added, enabling the escapement to lift the flippers more easily.

However, 3/16 inch dowels made for a too flexible system. Pronounced elevator flutter resulted in dives, on the first half of outsides, etc., and the ship "pulsed" into the ground vertically. Incidentally, no structural damage resulted in test flight crashes with the exception of the under portion of the wing center section; due to the wing profile, there is high pressure exerted by the cabin front against the undercamber. (It is suggested that the first rib out on each side be laminated to prevent dishing in of the covering sheet wood.) One-quarter inch dowels were a must modification, but this ties in with other changes in flipper design.

Control surfaces: For "normal" stunting the rudder area and movement shown are fine but for sharp rolls, a bigger rudder may be required. If area is added, eliminate a compensating amount of area from the fin leading edge—the ship is nicely co-ordinated now on turns and does not wind (unless it is not adjusted for straight flight), so the side area proportions should not be disturbed.

The flipper area and movement shown will not give outsides if the CG is moved very far forward. However, the CG position was determined by trial and it is best to keep the status quo—unless servos permitting trim in addition to full movement are installed, as with multi-channel. The balancing of the flippers is highly important. The mass balance should assist the flipper to rise easily on signal (try with the lowest number of turns you expect to fly with), yet should not fully balance the surface which then might flutter. The aerodynamic balance is precisely correct as shown. (Area forward of hinge line.)

More balance was used at first (with a forward CG), but, though outsides were performed) a slow elevator flutter developed. When balance area was reduced drastically the flutter disappeared, but so did the outsides. A compromise amount of balance area (as shown) avoided flutter and permitted outsides. With servos the balance will not be necessary.

Airfoil: A 15% thick NACA 64 sub2 415 is used. The camber high point is well back. The true airfoil has slight undercamber near the trailing edge but this was eliminated on the model. Three engineers predicted dire consequences but model airplanes are like the bumble bee which flies, but shouldn't. No ill effects were discerned. The ship is rock steady in a strong wind, even on low motor. In fact, wind ceases to be a consideration.

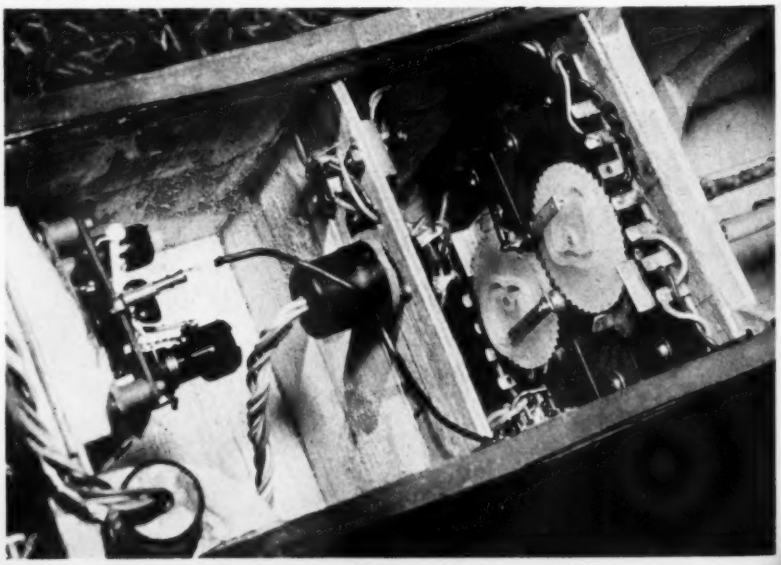
Incidence, Angular Difference, CG position: These three considerations are inseparable. It was found that a rearward CG, low incidence, and very little angular difference add tremendously to the ship's smoothness of flight and control, and enhance maneuvering. Although the CG supposedly should be much further forward according to the book, it appears that the book should be forgotten. This is true only of this type of airfoil. Without the serious travel of the center of pressure on the flat-bottomed sections, the airfoil used here is so stable that very little angular difference is needed. In fact, some people have flown such airfoils with a zero-zero line-up of wing and tail.

If the CG is displaced forward, more incidence is required in the wing and the ship immediately drags its feet and looses it's smoothness of maneuver at low speeds. With the finalized arrangement on the plan, experiments were made by adding pebbles to the nose, retrimming the tail when necessary. As weight was added, the outside loop diameter became larger and finally the loops could not be performed with the obtainable elevator reaction. A forward CG would be critical with a trimmable servo.

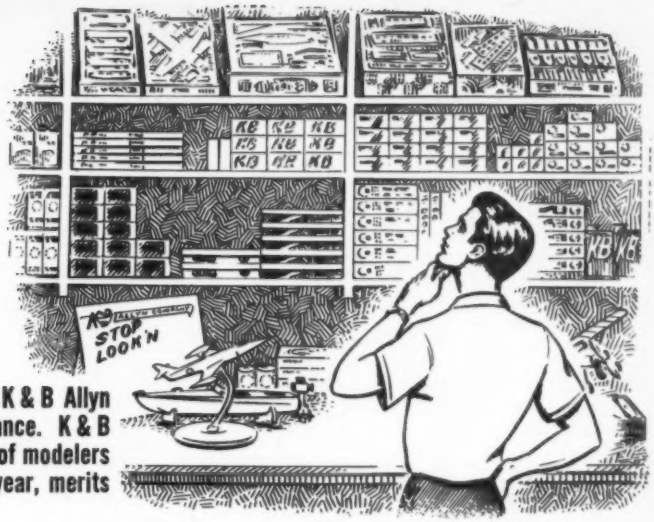
With greater decalage, or angular difference, the climb dropped off. Outside loop entries cannot be made properly from a nose-high attitude. Excessive decalage increases the tendency to split-S when attempting outsides—rather like having built-in up elevator.

Landing Gear: Made of two thicknesses of ¼ in. music wire, the shock-absorbing gear not once was bent in 49 test hops, including two steep dive-ins where (*Continued on page* 56)

VariComps mounted according to instructions, given in literature. Batteries, receiver, plug in.



STOP LOOK'N *



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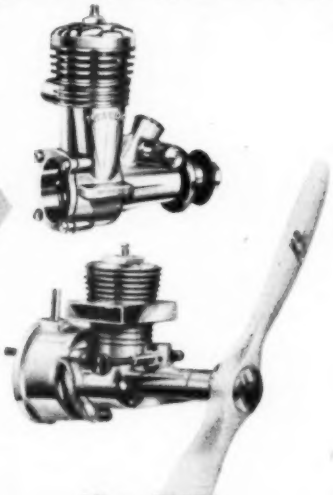
Flying



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Boating

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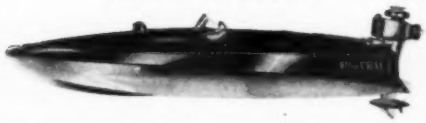

The Allyn CRAFT Speed Runabout. Though no recognized competitive events have been established for this type of boat we feel assured you'll find it the sleekest, fastest, and most stable boat in the model field. Powered with one of the Sea Fury Inboard or Outboard engines it maintains a fast continuous speed even in choppy water.

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½ Pts. 50¢ Pts. 85¢
Qts. $1.50 Gals. $5.50

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F.A.I. Decisions Confirmed

Well, well! After all the fuss and bother, the much disputed FAI proposals for 1958 have been adopted following the results of the postal ballot. Considering the world-wide expressions of disagreement that these proposed rule changes have evoked over the past few months, some of the ballot figures are astonishing.

The acceptance of the rule changes for free-flight gas models, which demand that a .15 cu. in. model shall weigh 26 oz. minimum for 580 sq. in. area (wing plus stab) maximum, was expected. The ballot showed 21 votes in favor to 4 against with 4 abstentions. These figures can scarcely be taken as an indication of readiness to abandon the present rules (17¾ oz. and 650 sq. in.) since the alternative was not the present rules, but the FAI's previously rejected formula calling for a 35-oz. model.

As regards the Wakefield, however, the ballot on the proposal to reduce rubber weight from 80 to 50 grammes revealed 18 votes in favor to 9 against with 1 abstention, despite the fact that this proposal had previously been rejected. Since so much has been written by Wakefield enthusiasts in all countries condemning the change, it would be interesting to know to whom the 18 "ayes" belong.

The voting on the control-line speed formula was no less remarkable: 20 votes for, 4 against, with 4 abstentions and confirming a rule which now makes the official World Championship speed model as big as a .60 job, though still having only a .15 motor. The revised team race rules, though perhaps more excusable, were accepted a little less overwhelmingly (16 to 10 with 4 abstaining). They now demand a model of .29 size but still with a .15 motor and 10 c.c. (⅜ oz.) gas tank.

South Africa

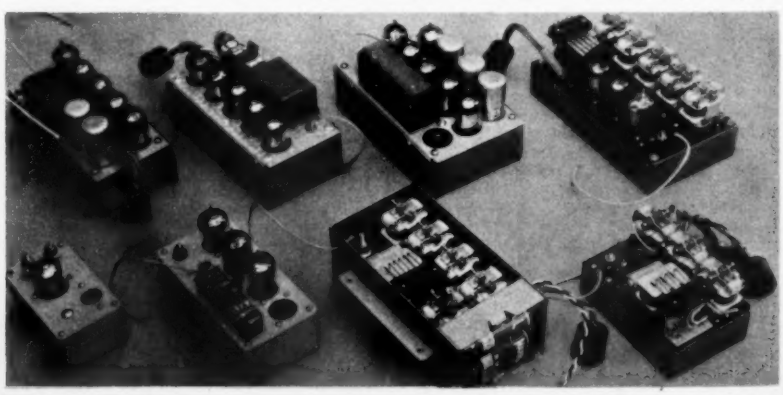
Modeling in some countries is done on a shoestring. Not so in the Union of South Africa. In S.A. you will find all the latest American kits and engines, really keen hobbyists, some excellent flying in all classes and, as in the U.S. and Australia, plenty of modelers who will travel a thousand miles to attend a Nationals meeting.

This year's S.A. Nats, as mentioned last month, were highlighted by the visit of Bob Palmer and Howard Bonner, and Jix (Pty) Ltd., hobby dealers, who sponsored the meet, spared no expense to make it a success. This, combined with excellent organization and wonderful weather, made the 1957 S.A. Nats one of the best yet. As last year, we are indebted to our Capetown correspondent, Pete Visser, one of the Union's top model fliers, for his impressions of the meet.

Rudolph Cerny, Czechoslovakian free flight gas champion, winner Soviet Internats, in Budapest.

Most popular were the towline glider events, with the main interest naturally centered on the Nordics, many of which were also entered in the unrestricted event. Designs were mostly of English origin, with an occasional German (Lindner) in evidence. Nordic winner was Hutchison of Western Province, Visser second.

Although relatively poorly supported numerically, keenness among the top men in the rubber events was high (a quite usual state of affairs everywhere). Visser won the Class A rubber, repeating his



Japanese O.S. Minitron experimental receivers. Bottom right, 5- and 3-channel transitorized.

South Africa's Pete Visser with new 3:58 dead-air Wakefield. Fuselage features molded sheet.

1952-53-54 successes, took third in Class B and second to Rowe in the Wakefield. Also worthy of mention here is the performance of third place man Jones, who, incapacitated by polio, flew from a wheelchair.

In contrast to most European national events where there is only a single f/f gas class (either FAI or unrestricted) the S.A. Nats features four classes: Half-A, A, B and FAI. The climb of the Half-A's was an eye-opener. In A and B the trend of design was markedly American with spectacular performances from Spacers and Ramrods. In FAI, designs were more representative of the variety seen at an English contest, except that almost everyone used glow plug rather than Diesel power.

Team racing (three classes flown) seems to be on the up-grade but speed is still on the decline. However, Jim Connacher set a new S.A. record in the jet class with 150 mph. Status quo appears to be maintained in stunt: "maybe a little better as Bob Palmer was judging" says Pete Visser, "needless to say everyone was flying a Thunderbird." As for RC: ". . . seemed good, but after watching Howard Bonner fly . . . well now!".

India

Our correspondent in Calcutta, Mr. K. L. Roy, who is also India's leading RC exponent, tells us of some of the difficulties that beset the RC enthusiast in India. There is, of course, no RC gear made commercially in India and such equipment is imported mainly from England and Germany. Apart from the possibility of damage in transit or through maltreatment when passing through customs at the port of entry, the main sources of trouble are the climatic conditions, the effect of which are quick-setting rust due to the monsoon season and dust due to shade temperatures up to 110°F. These play havoc with relays in particular.

Mr. Roy is anxious to point out that difficulties in obtaining trouble-free service from RC sets in India are not, therefore, due to the fault of the manufacturer. Nevertheless, having heard similar complaints from other users in tropical countries, we feel that manufacturers could help by hermetically sealing receivers or relay units, as is widely done these days in the tropicalization of electronic equipment.

Australia

Tony Farnan, distributor of O.S. engines in Australia recently sent us a list of O.S. engine successes in Australian contests. We knew that these motors had been doing well "down under", but 32 firsts and 13 seconds was even better than we had expected. Stunt (Continued on page 41)

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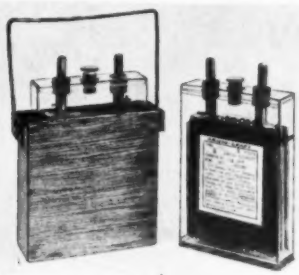

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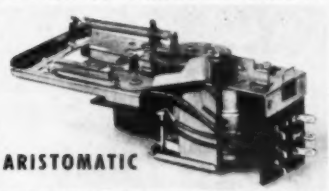

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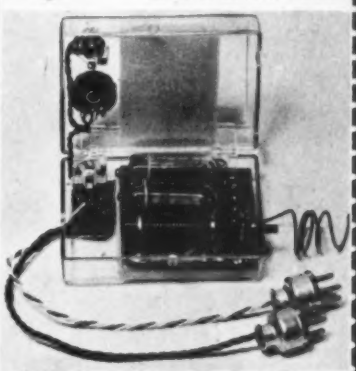

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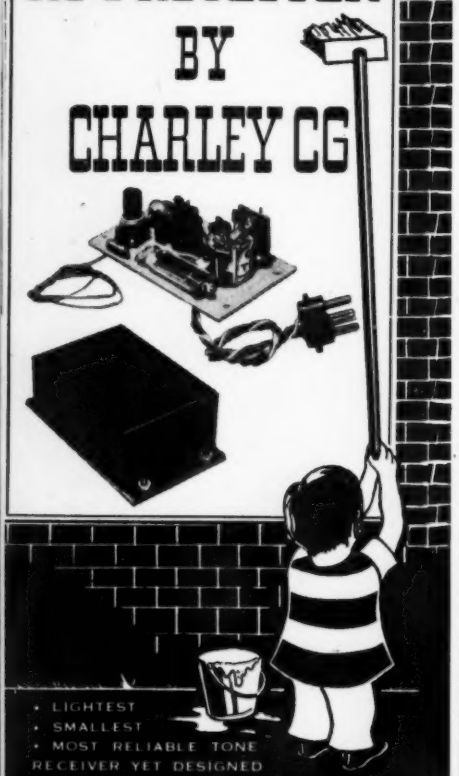

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For Higher Climb

(*Continued from page* 15)

only way to get the most out of the model.

ADJUSTMENT PROCEDURE

1. Shift the wing or move the CG until the CG is about at the 50% chord point (about half-way between the leading and trailing edges).

2. Adjust the engine mounting with shims so that there is about 2 or 3 degrees of downthrust in the thrust line.

3. Test glide the model several times and adjust the stabilizer incidence until all traces of a stall or zoom in the glide have just been removed. The glide should be straight with no tendency to zoom. The fin or tab can later be adjusted to put a very gentle or wide turn in the glide.

4. Adjust the engine and timer for a four- or five-second full power flight and try a flight. Watch what happens carefully.

5. If the model shows a tendency to loop or hang or mush in the climb, D is too small and should be made longer a little by shifting the wing forward or moving the CG aft. Now test glide again and readiust the stabilizer incidence to remove all traces of a stalling glide.

6. Trv another short flight. If the model still tends to loop or stall or hang, make D a little longer again by moving the wing farther forward or the CG farther aft. Again correct the glide by readjusting the stabilizer incidence to remove all traces of a stall.

7. Try another flight. Repeat step 6 until the climb appears to be straight without stalling tendencies.

8. Lengthen the engine run to about ten seconds and repeat step 6 until the climb appears to be steady and straight.

9. Lengthen the engine run to the full amount allowed by the rules and try another flight. If the climb is good we are getting fairly near the peak and future changes in D should be made in small steps, about 1/32 inch at a time.

10. Make D about 1/32 inch longer, readjust the glide by correcting the stabilizer incidence to remove all traces of a stall and try another powered flight. In fact, make several flights and observe the altitude reached in the climb *or time the flight duration*. Note what this altitude is or, better, the average duration (without thermals).

11. Now again make D about 1/32 inch longer and repeat step 10. If the altitude reached is higher than before (in 10) or if the duration is better we are still approaching the peak or maximum climb.

12. So repeat step 11 until a change in D produces less duration or climb. This means that we are over the peak climb and should shorten D a little (back up a little) to get the wing-CG distance that produces maximum climb.

13. Mark the correct wing or CG location on the model in permanent ink so that the tedious adjustment procedure will not have to be repeated in the future.

In all of the above tests, when the wing or CG is moved a little, it is important that the glide be correct. Sometimes it is difficult to know if the glide is really alright until the model is observed gliding in from about 20 feet or more of height. So if the glide has a trace of stall or dive correct this and make another set of flights before changing D again.

Actually, in some models it is necessary to get a refined final adjustment by changing D only 1/64 inch or so. This is tedious but worth the trouble.

Needless to say, for fine adjustments thin metal shims must be used for changing the stabilizer incidence and both the stabilizer and fuselage surfaces which contact each other should be surfaced with thin hardwood or plywood. Balsa wood, even saturated with glue, is too soft to hold fine adjustments.

So far we have said nothing about turn or circle in the climb. In order to keep the model overhead it is ideally best to adjust the engine side thrust and fin so that the model makes one complete circle in the climb. In general, avoid a multi-turning climb; it is inefficient, will not produce as much altitude. The glide can be easily adjusted to produce a gentle turn in the usual manner. We wish especially to point out that a spiral climb should not be used. (Except in a special case: a high powered model with a *high pylon* may become unstable and crash before "peak climb" is gotten; this indicates bad design, as the wing should be lowered so that the "peak climb" can be gotten.)

Spiral climbs are usually resorted to by modelers to prevent high-powered models from looping. Any looping tendency indicates improper CG-wing distance D for maximum climb, and this is prevented as described in the outlined procedure—not by putting a tight turn into the climb. It can be immediately seen in the field that when a model which has been adjusted to spiral up is adjusted to climb in one or two wide circles that the model will reach considerably higher altitudes and thereby produce more duration.

It should be pointed out that there is one case in which some spiral is necessary, but this indicates faulty design. In the case of a model which is unusually high-powered and has a high mounted wing (a high pylon mount) stability problems will be encountered before maximum climb point is reached. Here some spiral may be necessary but the better procedure would be to lower the wing mounting sufficiently to allow the model to reach its best climbing configuration.

Some modelers prefer to make the flying adjustments by changing the wing incidence rather than the stabilizer incidence. This can, of course, be done if desired. However, during the climb, a model's wing operates at a rather low angle of attack, so, for best efficiency, the wing should be mounted so that its chord line is approximately parallel to the fuselage center line. Fuselage parasite drag is considerably more important during the climb than during the glide.

Notice also that only a small amount of downthrust has been recommended, 2 or 3 degrees. This is an attempt to generalize for all cases. Certainly no more should be used by a modeler, but in certain cases even this much is not necessary. Attempting to prevent looping or mushing with lots of downthrust is as bad as using excessive spiral in the climb—only a little downthrust is beneficial.

If the modeler will seriously and carefully try this adjustment procedure on his models, we feel certain that he will improve the performance of all of them and gain a renewed interest in model flying. He is simply trying to find, by flight tests, the wing leading edge to CG distance which produces maximum climb. This procedure applies to gas jobs, rubber models, flying scale models and even hand-launched gliders. Remember one thing, the *changes in D should be made in small steps* (large ones could be disastrous) and the hotter the model the more sensitive it's climb will be to even small changes in D.

When adjusting a rubber model, needless to say, the modeler does not ever start out with full power as in the case of gas jobs. There is no such thing as a short full-power flight with rubber jobs. Instead,

you proceed in the usual manner, working up from a few hand winds to full winder winds. Along the way, however whenever a stalling tendency shows up in the climb, you correct it by increasing D a little and retrimming the glide, just as with the gas job. And if, as sometimes happens with rubber jobs, there appears a tendency to slowly arc over and dive in or not climb under high power, you correct it by shortening D a little and retrimming the glide at the stabilizer. For every rubber model there is some one length D which will produce maximum duration but, if the prop or rubber motor is changed considerably, a new value of D must be found for the new power combination. With present methods rubber model adjustment is a "compromise".

Foreign Notes

(Continued from page 39)

and combat accounted for most successes, followed by team-racing, then free-flight.

The active Newtown M.A.A. have a scheme that may be worth copying—especially as it is said to help club treasurers in the onerous duty of trying to pry annual subscriptions from members. Scheme is to hold three contests for each class spaced out over the year, awarding points, 3, 2 and 1 in order of placings. Club subs fall due at the end of June. Thus members are obliged to renew promptly in order to keep in the running for club championship honors.

East Germany

Something which, if it works as claimed, could be a boon to free-flight men, has been announced by Karl Lehniger of Potsdam in East Germany. This is a small smoke cartridge, weighing only ½ of an ounce and designed to emit a dense white smoke for 10 to 15 minutes. Anyone who has searched for hours in tall grass or a cornfield for a lost model (and, maybe, only got it back when a combine had reduced it to splinters) will appreciate the value of such a device fitted to a model.

The Lehniger cartridge is a mere inch long and half-an-inch in diameter and consists of an aluminum cylinder with removable end-cap. The base and sides of the case are covered with a plastic insulation and there is a hole in the center of the cap through which the fuse is lead to the charge inside—much the same arrangement as a Jetex unit. The chemical nature of the charge is not disclosed but refills are quite cheap—50 pfennigs for a box of 10, which is the equivalent of about 1c each at the official rate of exchange.

Britain

A new national RC glider endurance record of 2 hr. 23 min. 19 sec. has been claimed by F. Vale and D. Illsley of Birmingham. This more than doubles the previous mark.

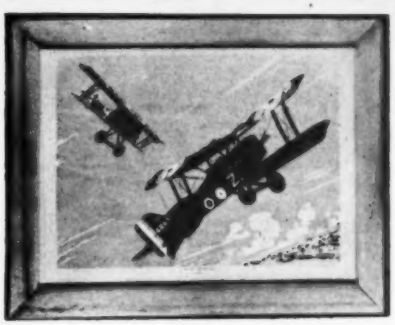
The Eta 29 racing engine (similar to McCoy's Red Head 29, with twin ball-bearing shaft, ringed aluminum piston and disk rotary induction) is to be re-introduced in a new Mk. V version.

Japan

The Ogawa Model Mfg. Co. (O.S.) have been busy with numerous experiments in new RC receivers, including two, three and five channels with up to five tubes, also three- and five-channel sets fully transistorized. In the O.S. engine department, several experimental .15 cu. in. Diesels have been built and a production model is expected in the fall. Also on the list for early introduction is a new .099 glow engine.

Italy

The Coppa Supertigre event mentioned last month as scheduled for June 1-2 was postponed and moved to Bologna.



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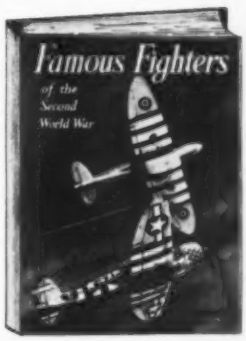

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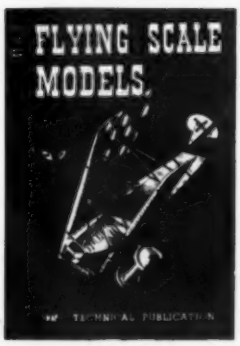

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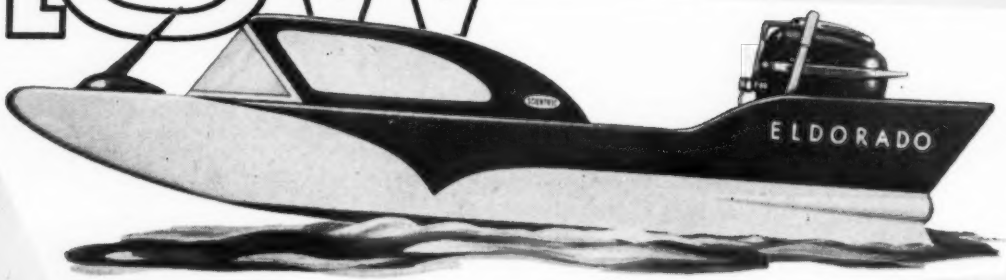

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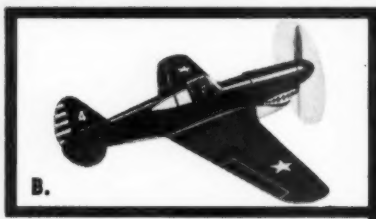

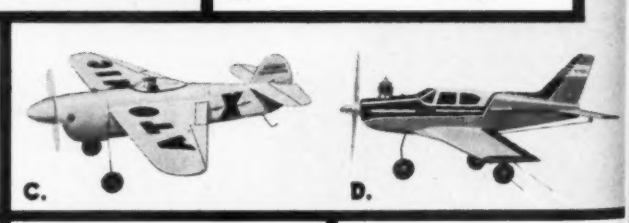

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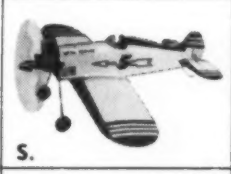

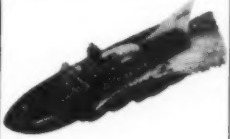

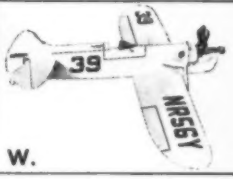

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STUNT OPEN
George M. Aldrich
Tyler, Texas
321.33 points
Engine: Fox 35
Fuel: Fox Superfuel
PROP: 10-6 TOP FLITE
Plane: Nobler

NAVY CARRIER OPEN
Sal Trafo
East Meadow, New York
Engine: Fox 59
Fuel: Powermix
PROP: 10-6 TOP FLITE
Plane: Grumman Guardian

FLYING SCALE FF JR-SR
Bob White
Corpus Christi, Texas
84.55 points
Engine: Atwood Shriek
Fuel: Thimble Drone
PROP: 8X-4 PLASTIC TOP FLITE
Plane: Bald Pate

COMBAT OPEN
Riley Wooten
Lubbock, Texas
100 points
Engine: Torp 35
Fuel: Fox
PROP: 10-5 POWER PROP
Plane: Quicker

A GAS FF JUNIOR
Kenneth D. Siebold
New Orleans, La.
Time: 9:36.8
Engine: Thermal Hopper
Fuel: OSR AA
PROP: 6-3 TOP FLITE
Plane: Nixi

FLYING SCALE CL OPEN
Capt. Richard Moorhead
El Paso, Texas
200 points
Engine: 6 K&B 19's & 4 Johns 15's
Fuel: K&B 100
PROPS: 7-7 SPCL PUSHER POWER PROP
Plane: B-36

B GAS FF SENIOR
Johnnie Wertz
Glidale, Calif.
Time: 10:25.0
Engine: Johnson 29
Fuel: Nitromix
PROP: 10-6 TOP FLITE
Plane: Ramrod 250

ALL THOSE LISTED ARE FIRST PLACE WINNERS!

C SPEED JUNIOR
Thomas Kovan
Dallas, Texas
Speed: 136.0 mph
Engine: McCoy 60
Fuel: Home brew
PROP: 9-12 POWER PROP
Plane: Original

COMBAT SENIOR
Bruce Brown
Levelland, Texas
Engine: Torp 35
Fuel: Testor "39"
PROP: 10-6 POWER PROP
Plane: Quicker

NAVY CARRIER JUNIOR
Donald Sterner
Belleville, Illinois
249.85 points
Engine: Fox 35
Fuel: Nitro X
PROP: 10-6 TOP FLITE
Plane: J. Roberts Sabre

B GAS FF JUNIOR
Dennis W. Alford
San Diego, Calif.
Time: 14:01.0
Engine: Johnson 29
Fuel: Ohlsson 200
PROP: 10-3½ TOP FLITE
Plane: Sandy Hogan

NAVY CARRIER SENIOR
Glen A. Magree
Cleveland, Ohio
307.16 points
Engine: Fox 59
Fuel: Own mix
PROP: 10-6 POWER PROP
Plane: Bearcat

R.O.W. GAS SENIOR
Lee Hines
Torrance, Calif.
Time: 10:15.0
Engine: Thermal Hopper
Fuel: Thimble Drone Racing
PROP: 6-3 PLASTIC TOP FLITE
Plane: Ramrod 250

RADIO CONTROL (MULTI)
Howard Bonner
Los Angeles, Calif.
197.5 points
Engine: Fox 35
Fuel: K&B 100
PROP: 11-6 TOP FLITE
Plane: Original

PROTO SPEED JUNIOR
Jere Draper
Cleveland, Ohio
Sp: 96.42 (New Record)
Engine: McCoy 29
Fuel: Home brew
PROP: 8-8 POWER PROP
Plane: Veco Redskin

FLYING SCALE CL JUNIOR
Wm. Bryant Brown
Louisville, Ky.
159 points
Engine: K&B 35
Fuel: Exothermic 28
PROP: 10-6 TOP FLITE
Plane: Ju 87B Stuka

FLYING SCALE CL JUNIOR
Jimmie McCroskey
Fort Worth, Texas
303 points
Engine: K&B 29
Fuel: K&B 100
PROP: 9-5 TOP FLITE
Plane: Mustang (orig.)

C GAS FF JUNIOR
Dennis W. Alford
San Diego, Calif.
Time: 12:50.7
Engine: Johnson 35
Fuel: Ohlsson 200
PROP: 10-5 TOP FLITE
Plane: Sandy Hogan

AM. CL. PAA LOAD OPEN
Willard Blanchard, Jr.
Hampton, Virginia
Time: 11:39.4
Engine: Thermal Hopper
Fuel: Thimble Drone Racing
PROP: 6-3 TOP FLITE
Plane: Payee

HELICOPTER
Parnell Schoenky
Kirkwood, Missouri
144.1 points
Engine: Atwood Sig.
Fuel: Nitro XX
PROP: 6-3 TOP FLITE
Plane: Original

STUNT JUNIOR
Dennis W. Alford
San Diego, Calif.
299.5 points
Engine: Johnson 35
Fuel: Home brew
PROP: 10-5 TOP FLITE
Plane: Thunderbird

A GAS FF JUNIOR
Gene Boyd
Los Angeles, Calif.
Time: 12:22.0
Engine: K&B 19
Fuel: K&B 100
PROP: 9-4 TOP FLITE
Plane: Original

R.O.W. GAS JUNIOR
Dennis W. Alford
San Diego, Calif.
Time: 10:28.7
Engine: Johnson 35
Fuel: Ohlsson 200
PROP: 10-5 TOP FLITE
Plane: Sandy Hogan

RC (RUDDER) JR.-SR.
Gerald Nelson
San Leandro, Calif.
83 points
Engine: Fox 19
Fuel: Blue Blazer
PROP: 11-4 TOP FLITE
Plane: Live Wire Cruiser

B GAS F. F. OPEN
Richard McGrath
Long Beach, Calif.
Time: 28:35.1
Engine: Johnson 29
Fuel: Ohlsson 200
PROP: 10-6 TOP FLITE
Plane: Original

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Designed by George Aldrich, America's Greatest Stunt Champion!

KIT No. N-2 only..... $3.50

FLITE STREAK is a Top Flite exclusive.

SPECIFICATIONS:
Wing Span: 42 in.
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Length: 28 in.
Engine Sizes: .15 to .35

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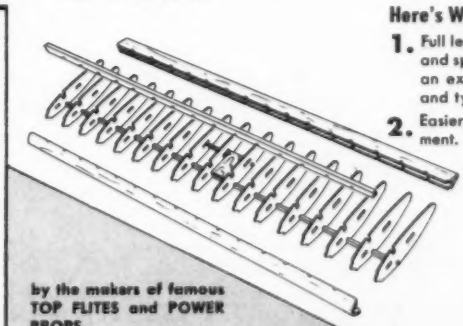

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R/C TRANSMITTER

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TRANSMITTER 1 Burgess, 2D or RCA VS069 Net. Ea. .45
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F-255 ..... Net 2.45

SPECIAL COMBINATION OFFER

Consists of R/C Transmitter (F-249), R/C Receiver (F-208) and Escapement (F-255). All three at a super special price.
F-283 ..... Net 28.95

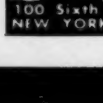
NEW! LITTLE "JEWEL" REMOTE CONTROL RELAY

- The Mighty Mite of the R/C Field
- Weighs less than ½ oz!
- Size: 3/4" H, 17/32" W, 1-1/16" L

2.75

A natural for remote control receivers, it is highly sensitive, and built to withstand severe crashes. The smallest commercial job available, it weighs less than ½ oz. Factory adjusted to pull in at 1.4 MA, drop out at 1.2 MA D.C. Single pole, double throw. Used in outstanding R/C receivers.
5,000 ohm coil F-260 ..... 2.75

27.255 MC REMOTE CONTROL CRYSTAL



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Czepa on Airfoils

(*Continued from page* 21)

variation of the airfoil. (Curved plate Goett .417a). It is wasted effort to place a turbulator in front of a sharp nosed section. At present, however, no reliable measurements are available of the possible beneficial effects of turbulators on the wing, or guide vanes above the upper camber, to hold the boundary layer close to the wing's upper surface for a longer portion of the upper camber. Research in this area would be profitable.

The entry and departure angles of the undercamber were made similar to the departure angle of the upper camber, that is, from 6 to 14 degrees, but the entry angle on the under side was always a bit higher in order that the advantage of a highly curved front of the upper camber could be achieved. The variance from 6-14 degrees may be explained by the high number of airfoils of various heights which were tested. One can say simply that the mass of air which is taken by the wing and guided downward results in lift. On the upper side, the departure angle is determined by the maximum height chosen for the airfoil. If one makes the departure angle of the undercamber as parallel as possible to that of the upper-camber, he maintains the most advantageous means of continuing the airflow down away from the wing thereby producing the maximum of lift. The proof of this theory is found in use of very thin back portions of airfoils, similar to bird wings.

In comparing the airfoils mentioned in the introduction, we see immediately that those with a maximum height of 9–10% yo uppercamber proved best in our tests. When maximum heights were increased, performance declined rapidly. With use of a lower yo only a gradual drop of performance was discovered. The energy of the airstream at our airspeeds is small. Therefore, it can overcome only a certain airfoil height. Otherwise, if all the air's energy is used in the airflow's reaching the maximum height, none will be left to hold it on the wing's srface toward the trailing edge.

We spent a long time in determining the optimal position of the airfoil's high point (yo). The extremes here are the so called laminar airfoils where this point is at 50-65% and the airfoils where the maximum height is at 15-20% of the chord. Certain things may be said about these 50-65% laminar airfoils. In a full-sized plane, the boundary layer is kept laminar by the use of a round-nosed airfoil in order that the drag of friction is reduced. Only the extra energy given the airflow over the wing by high speeds makes this possible. The drag of friction of the turbulent boundary layer, on the other hand, is greater. It was thought that this airfoil design would enable us to achieve a laminar airflow, that is, one with little drag over the greater part of the airfoil, without the danger of a departure of the airflow from the wing. This was an error.

With the smallest angle of incidence, that is, minimum lift, this principal still applies. With increasing incidence, however, the stagnation point travels around the nose downward and the beginning of a turbulence in the boundary layer begins. In other words one may no longer speak of a laminar airfoil. From comparative tests by Schmitz one learns that the air moves increasingly rapidly over the entry surface, but because of the gradualness of the curve, the acceleration of the airstream is gradual. For this reason, the total lift achieved is quite small. Through

the flat incline of the nose, the amount of energy of the airstream at the point of maximum height is too limited to keep the airflow on the surface of the trailing edge which falls away so rapidly. In addition, the change of center of lift from far back to far forward with increase of incidence produces an airfoil which is very critical in it's longitudinal stability.

The most effective placement of the high point of the upper camber (yo maximum) was found to be between 30 and 40 percent of the chord. If it is placed further back, there is a severe drop in performance. If it is further forward, though performance is not severly affected, the airfoil flies more critically.

Hand in hand with the determination of the optimum high point of the upper camber, goes the determination of its form. A true ellipse seems to be the best shape in front of the maximum point. More extensive curving, that is, more of a hump, shows a slight flattened decrement in performance while a flatter curve shows greater performance loss. In the determination of the form of the upper camber behind the maximum height, one finds the differences in performance caused by design relatively small. Therefore it is hard to say if the curve to the trailing edge is best if straight, moderately curved, or sharply curved. Theoretically, the flat airfoil should be most advantageous, because the loss of energy which naturally accompanies the flow of air from high point to trailing edge (Increase in pressure) at least if this line is flat. We designed most of our airfoils according to this.

The form of the bottom of the airfoil is for the most part responsible for the difference between ideal (theoretically best) and practical sinking speed. Once again, we must sacrifice or compromise in the determination of our airfoil. On the average, the best undercamber height (yu maximum) is between 4 and 6% of the chord. A steeper entry angle of the undercamber is more advantageous in calm air, but it results in great performance loss in windy weather. The best position of yu (the highest point) was from 40-60% of chord. Moving the point forward made the airfoil critical in windy weather conditions, moving it back brought decrease in its ideal sinking speed (calm air). We can see, therefore, why flat-bottomed airfoils have not too surprisingly won many contemporary contests held in the wind. However, it is not necessary to carry this principle that far, and one can achieve good windy weather performance without sacrificing undercamber. For example, one can make the front portion of the undercamber flat (see diag. VIII), or, as in the case of the "Flamingo" airfoil (Diag. IX), through the addition of a bulge which is bypassed at high angles of attack, giving high performance but at low angles of attack acts as if there were no indentation in front of the bulge (diag. X).

When the incidence is reduced with an airfoil on which the entry angle of the undercamber is a sizable one, burbles of air develop (diag. XI). The stagnation point goes around the nose to the upper side, and the airflow on the upper surface remains laminar and starts to break away from the surface. In practical terms, this means that with normal airfoils, one must try to shape the front portion of the undercamber as tangentially as possible to the airflow which meets the wing. Airfoils with artificially induced turbulence (a round nose with a turbulator) are, for this reason less critical in gusty air.

The shape of the undercamber back of

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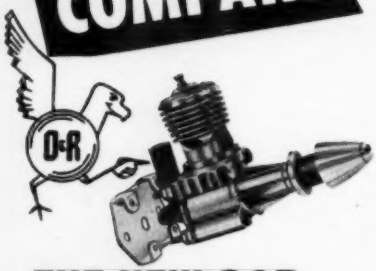

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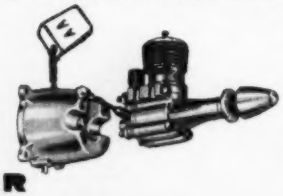

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its maximum height was also varied for study. Without curve, a slight drop in performance was noted. A sharp concave curve such as used by the Hansen and the Denmark school of thought showed an even greater drop in performance on thin airfoils. The Denmark school curves the last 10% downward, making flight of the airfoil critical for reasons explained above. But, when the downward concave curve is begun at 60% of chord, a relatively high increase in pressure on the bottom is achieved, greatly increasing lift and performance. This is true only in the case of thin airfoils of the type described here or airfoil designs similar to MVA 227.

It was noted that performance decrements because of angulations, corners, or bulges (diag. VIII, IX and XII, marked with 0) was very small. This came out, strangely enough, in experimental attempts to simplify construction.

From all that has been discussed so far, one can see that good airfoils are not developed through the use of only a French curve and a good eye, but through a well thought out combination of series of compromises. Such an airfoil was used in my 1951 "Toothpick" model (diag. VIII). Since that time, I have continued to evaluate this airfoil and substantiate the contentions made in this article. For such variations, a very suitable beginning point in the airfoil MVA 342 (diag. XIII), which I would recommend to people interested in model gliders.

One must always recall that the actual performance gained from an airfoil can only be observed after very careful flying tests with various angles of incidence. These tests should only be made with a short line, in calm air (morning or evening) to exclude the external effects of thermals and turbulent air. To be certain of what is happening with each setting, at least ten flights under identical conditions should be made and an average taken of the resulting flight times. This may seem tedious to the average model builder, but after he has once leaped into this ocean, he will find the water invigorating and see before him a new experience in model flying which he previously did not dream existed.

The Great Lakes

(*Continued from page* 11)

cement the two 1/16" plywood reinforcers to former D before attaching Pc. 3. Bend the tailskid from 3/32" wire, bind it to the ⅛" plywood mount, and cement both securely in place. The fairings are made by cementing 1/16" thick strip to the trailing edge of all landing gear struts as indicated on the side view. When dry, wrap the struts with layers of masking tape until they are built up to correct size.

Plank the upper part of the fuselage aft of the cockpits with soft ⅛" strips and then cut the upper fuselage block, and cowl blocks to shape. Hollow the lower cowl block to clear the motor mounts and then cement all three pieces temporarily in place on the fuselage. After carving them to shape they are removed and hollowed to a thickness of about ⅛". The lower cowl and top fuselage blocks can now be permanently cemented in place. Be sure to drill the engine mounting holes and insert blind mounting nuts in the engine mounts before attaching the lower cowl. Make a hole for drainage of excess fuel and give the interior of the cowl several coats of hot fuel proofer.

The wing is constructed in the conventional manner. Pin down the spars, then add the ribs, leading edge, trailing edge

(*Continued on page* 50)

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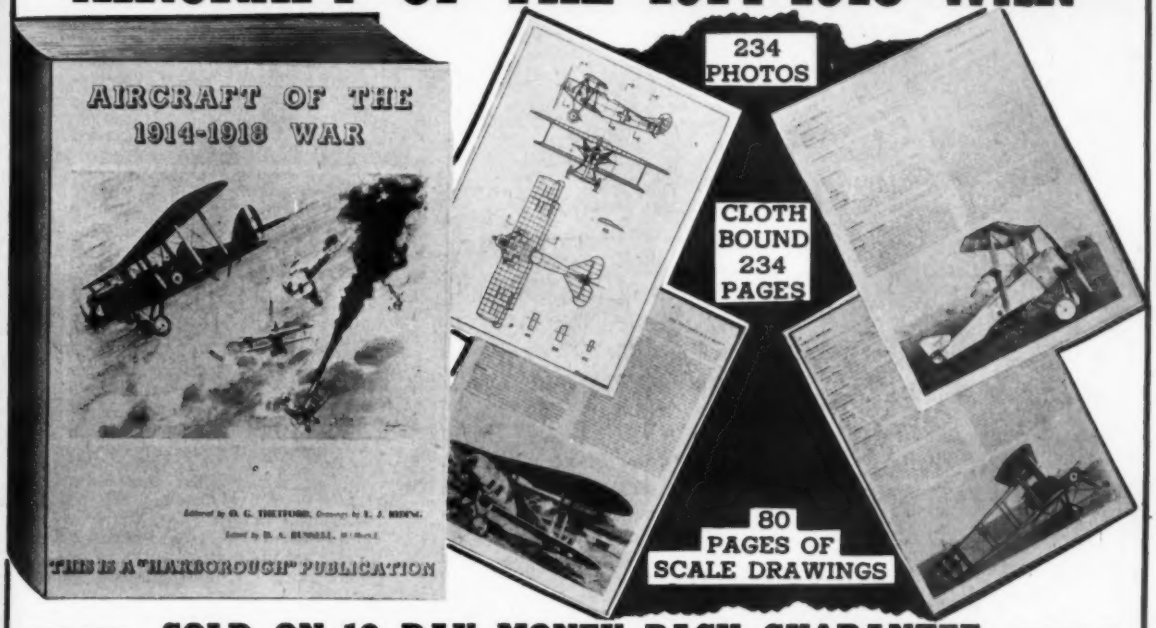

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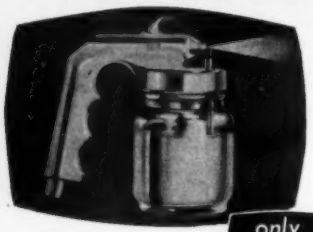

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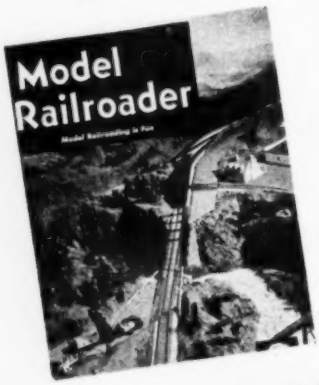

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and finally the tips. It will be necessary to use shims under one spar, leading and trailing edges since the lower surface of the wing is not flat. Be sure to construct the center section of the upper wing in one piece. The tip and center section ribs can be shaped after assembly and don't forget the half ribs which form the openings for the wing struts. Now add the dihedral, hard balsa gussets, sheet covering and give the entire wing a good sanding which now readies it for covering. Use silk or heavy Silkspan as the covering material.

Join the lower wing, to the fuselage, add the plywood gussets, and cover the lower fuselage with ⅛" sheet balsa. After the balsa headrest and plastic tubing for cockpit combing are added, the fuselage is ready for finishing. Cut the outer wing struts from ⅛" plywood and cement them to the lower wing.

Cover all exposed wood surfaces with light Silkspan, and give the entire model five coats of sanding sealer, sanding lightly between coats. Follow this with four coats of colored dope. Mask off the trim areas, give them one coat of clear dope to prevent the colored dope from running under the masking and then spray on four coats of trim color. The color scheme is as follows: Fuselage, vertical tail and struts are the background color and wings, horizontal tail, and fuselage strip the trim color. The original model was painted cream and orange with black Trimfilm license numbers. For a mirror finish rub with rubbing compound. Apply the license numbers and finish the model with a coat of wax.

Finally mount the upper wing, inner struts, flying wires, Plexiglass windshields, engine, and fuel tank and the model is ready to go. It should balance at the point shown on the plans. Add weight to the nose or tail if necessary.

Rat Racing

(*Continued from page* 16)

we would need four pilots (one per plane), pit crews (usually two per plane), four lap-counters (one per plane), a race-starter and flag man (one per race), and an event director (one per event day). The number of persons needed on this ideal basis comes to 18. Your organization may not be that large or may not be able to get that many members out at the same time. What then, is the minimum? We will need a pilot for each plane. He must be allowed to come out of the circle during pit stops. In this way we can cut the pit crew per plane to one. Then there is a need for a starter who can also take charge of the day's racing and thereby eliminate the event director. What about lap counters? If the pit-crew members are put on the honor system there is no reason why they cannot count the laps also. It should be understood that this is the absolute bare minimum that could possibly be used and even this figure comes to nine persons participating.

You are probably beginning to understand why these racing events offer so much for the moral of club organizations. So far, however, we have just spoken in general about the two types of racing. Is one better for the ordinary club use than the other?

Refering to the AMA rules and regulations book, note that Team Racing planes have to conform to rather strict specifications. Rat Racing planes, on the other hand, do not have these close building restrictions. Consequently, a person can use prac-

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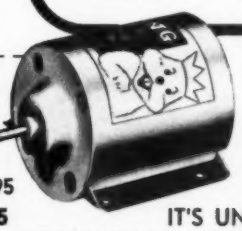

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tically any plane he has available. It would seem that this latter type, Rat Racing, is what we are looking for to give us that easy group-type competition activity.

This is true, but only in a broad sense, because even this event has to be modified in order to hold the modelers' interest. In any racing competition everyone is trying his utmost to win. That's a fine spirit—but since there are no major building restrictions in Rat Racing, along comes a fellow with a small plane specially-built for this sport and, after a couple of club races, it becomes obvious that this type of plane is hard to beat except with a similar plane.

Why don't the other members build some of these small specialty-type planes? A few of them will, but most will continue to build all-purpose type combat ships. After two or three more races the other members get discouraged with the impossibility of winning against this type of ship and so we're back where we started with low interest!

Can Rat Racing be modified to be more useful and flexible?

The reason the members were getting discouraged was because a few had these small, fast, special-built planes for this sport. The members that did not build special planes for Rat Racing were either too lazy or didn't especially care to spend the added time constructing one-event type planes. This did not mean that they were uninterested in this competitive group racing but it did show that they didn't want to fly in races where there was no chance for them to win with ordinary planes.

Suppose we were to modify the present Rat Racing rules in such a way that the fellows with the special-built type planes were in one category. Then the members who just wanted to have the fun of racing any old plane could have a class to themselves. The easiest way to form a distinction between the two new classes would be through wing area, since the greatest difference between the types of planes will be just that. Instead of just calling our two new Rat Racing classes A and B, let's give them names. The first we will call *Custom Rat Racing*, especially for those small special-built ships. The other we will call *Stock Rat Racing*, which will include kit, profile, and home-built planes of the common variety. To put some rules in writing:

RAT RACING RULES,
CLUB COMPETITION

The AMA Team Racing rules will be enforced for all Rat Races with the following exceptions:

I. Rat Racing will consist of two categories:
   A. CUSTOM RAT RACING
      1. *Wing area*—In this class the *maximum* wing area allowed is 150 sq. in.
   B. STOCK RAT RACING
      1. *Wing area*—In this class the *minimum* wing area allowed is 280 sq. in.

II. General Rules
   A. *Engine size*—Maximum .36 cu. in. disp.
   B. *Landing gear*—Optional.
   C. *Spinner and engine cowl*—Optional.
   D. *Cut-off*—Allowed but optional.
   E. *Minimum number of planes*—For an official race, two.

(*Continued on page 52*)

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In this way the majority of the members who just want the excitement of competition racing but do not want to build especially for it can use any ship that is available, while, on the other hand, the few serious, ambitious members also have a class in which they can build and strive to win. There is really no reason why a club cannot hold practically an unlimited number of races during a year's time, since a modeler can enter either class depending on what he has in flying condition.

The average club organization will wonder how it can afford awards or prizes for all these events. If the club had to buy prizes for each race, it would be broke in a short time. But, if what is known as perpetual traveling trophies were used, the problem would be greatly simplified. The cheapest yet most interesting kind of this trophy is that which is initially constructed by the members and known as a "junk" trophy. Every time a race is held this "junk" trophy is presented to the winner and then he hangs on it some small memento such as a broken engine part, smashed spinner, bad plug etc. The racing names and dates of the winners are also inscribed on the trophy.

Club organizations will find that by using perpetual traveling trophies of this sort the active entrants in group activities will increase considerably and the members will strive much harder to win.

These modified rules for Rat Racing have yet another advantage. Now available to the flying modeler are three distinct racing classes: Stock Rat Racing, Custom Rat Racing, and Team Racing, which can be used in progression to build self-confidence as the builder becomes more adept to group-type building and flying.

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Big Inch

(*Continued from page 25*)

strip balsa. For the pylon use ⅛ x ¼" strip stock. When sufficiently dried, remove from the plans and sand smooth. Give the exposed edges a sanded radii on leading edges, trailing edges and tips. Notch the balsa tube fore and aft and cement the pylon and rudder securely in place. Keep these perpendicular to the horizontal center line of the fuselage. At the tail end of the tube below the rudder, cement the stabilizer mounting pad, use 1/16" sheet balsa. Check the above mentioned assemblies once again for proper alinement. If correction is required, by all means do so.

Fasten to the top of the pylon a 1/16" balsa sheet wing rest. When cementing, incorporate the required dihedral angle and two-degree positive incidence angle as indicated on the plans. Here again, check for proper alinement with particular attention to the angular setting of the wing rest.

Fashion nose and tail plugs from scrap balsa stock, starting with dimensions sufficiently large enough to end up with what the plans call on the finished product. Maintain a snug fit in the fuselage tube to prevent the plugs spinning when rubber motor is under load. We should mention that the above plugs be modeled from reasonably hard balsa, for obvious reasons.

With this behind us, only the wing remains. Here we believe we attained simplicity and Vee dihedral makes assembly even easier. Build both panels at the same time—they are identical. The leading edge is ¼" sq. stock, trailing edges are ⅜ x ¼" strip balsa, and the end ribs of ⅛" sheet reinforced as indicated on the planes. The reinforment is to prevent the end ribs from warping inward due to pulling of the dope. The spars are 1/16 x ⅜", and 1/16 x ¼" strips. The panels are joined at the center rib, with the spars lap-jointed and cemented securely. Note the three-inch dihedral built into the wings. After the cement has dried, sand all surfaces, removing all sharp edges and excessive cement. Blend the leading and trailing edges by first shaving with a razor, then smooth over with sandpaper.

Tissue or light grade Silkspan is used for covering. Commence with the wing. All surfaces, including those of wood, are covered. We chose red paper and trimmed the completed stick in lemon yellow. Apply two coats of clear dope (thinned 50%) to all surfaces.

In covering any surface, be certain the grain of paper is in the longest direction. Thus, in covering the wing panels, the grain of paper is run spanwise. The experienced builder predopes all to-be-covered wood surfaces. We strongly advise it here. When covering the wing of our Big Inch, start with the flat bottom surface first, then proceed with the upper cambered surface. Allow approximately ¼" overlap all around, that is, leading edge, trailing edge and tip, then tuck under and dope secure. Pull the covering to remove as many as possible of the wrinkles, dope the outer edges one at a time, then place the covering on the moistened edges and begin to snug the paper from leading to trailing edge, and center section to tip. When complete, apply a brush stroke of dope over these same edges.

To further remove the wrinkles, water spray the wing one half at a time and pin to a flat, wooden surface. Place small, flat pieces of sheet balsa between the wing (and tail) and the table top to prevent accidental sticking. Place these scraps about six inches apart, around the edges. When dried, lightly brush two coats of clear dope on covering while still pinned in place. When dried, remove and dope the lower surface. Proceed in a similar manner with the remaining panel. This is a good pro-

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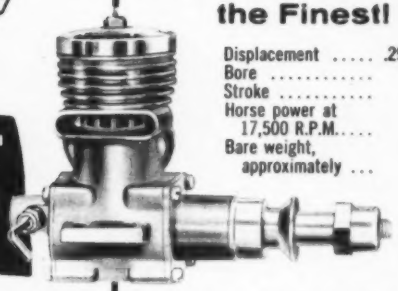

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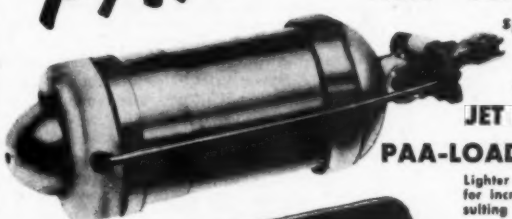

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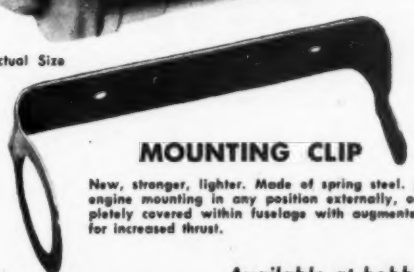

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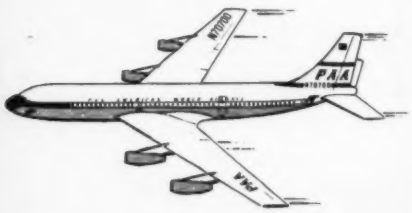

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cedure since it helps prevent wing warps.

The full-size plan sheet illustrates the prop and tail hook shapes. Use 1/16" wire to shape both hooks. The open loops are first shaped, then slipped into their respective blocks and the bending completed. The outside loop in the tail hook is for rapid hand-drill winding. Slip small diameter plastic tubing over each hook, assemble the six strands of 3/16" flat T-56 rubber motor.

As was mentioned earlier, we felt no need for a landing gear. The flight test procedure is similar to that of any other model. Hand launch without power to establish a true flat glide with slight right turn tendencies. If your model balances 1/3 back on the wing, little trouble will be experienced in trimming for flight. We might add, go easy on power until satisfaction is guaranteed in successively good flights. Some 800 turns can be packed into the rubber motor by stretch winding—too much power should the Big Inch be cut of trim.

It is possible that your completed model will not balance where indicated. The correct position can be reached in one or two ways; shifting the wing (go by balance point in relation to chord of wing), or, adding a small amount of weight to the nose. In some cases both may be required. The model should glide with a slow right turn. Should this not be the case, the rudder can be warped with breath until the glide turn is accomplished. Powered flights are something else again.

Hand wind the motor some 150 turns, then launch. If all is well, the model will climb sharply in a circle to the left. This we found to be ideal. Under full power, the model will turn more sharply with a greater rate of climb. Should the model stall under power, and the glide look good, add a little downthrust to eliminate the power stall. If need be, a thin metal trim tab could be added to the rudder (about one inch square). If warping the rudder is not enough, bend this tab.

For those not familiar with rapid winding, let us add a few words. A standard hand drill is used with a hook fastened in its chuck. The hook engages the loop in the tail plug. Hook up, and pull the rubber motor taut as shown in the picture (Daddy's little helper), proceed to wind, at the same time walking towards the model as the turns are imparted. Do not walk in rapidly as this will cause the rubber knots to bunch up. The rubber motor will accommodate approximately 800 to 900 winds. However, shy away from frequent winds to maximum power since the strain may cause a fracture in the balsa tube. A winder is suggested for all day flying or when a boastful flight is the order of the day. By stretch winding the rubber, the duration of the propeller run is greatly increased. The model then flies higher, farther, and longer. Don't lose it!

SEV Custom Rat Racer

(*Continued from page* 17)

of 24 flights.

This low wing version looked good but we were not satisfied since there was an unstable tendency in take-off and there was a bit of hunting, just before she hit a groove. So, we changed again.

This time it was to the general idea you see on these plans. In order to improve handling we went to a high aspect-ratio, high-wing position. We knew that the high aspect-ratio wing in a small ship of this kind leads towards better handling characteristics, having used them in a number of our experimental Team Racers.

The outcome was encouraging in that both the take-off and air handling were smoothed out. The top speed, however, was increased only to around 100 mph.

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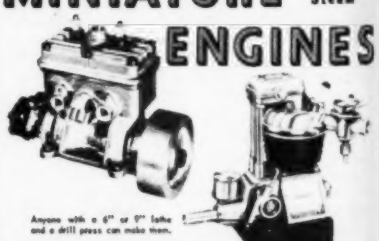

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Pleased as punch to date with performance of ½A Blazer. It has lived up to all my expectations . . . the unusually thin wing gives blazing climb, flat glide . . . beautiful soaring flights . . . it's difficult to describe your feelings as you see it spiraling up there. Sure ought to win its share of contests. All die-cut balsa parts, step-by-step illustrated full-size plans. 40" span, designed for .049 engines. The Blazer is on your dealer's shelf now . . . and it's only $2.50.

HI FELLOWS — There are many new notes and a hot new contest idea (see below) in my notebook this spring and I thought you would be interested in some of them. It's really great to see that more and more modelers are getting the thrill of flying as well as building. There's nothing quite like watching that plane taking shape step by step, and looking ahead to the excitement of flying it!

INCIDENTALLY, I'VE BEEN GETTING applications from all over the country for that Model Pilot's Certificate we offer (details on the $1 kit plan too). You just beat the time specified on the plan, using one of my kits. First application came from Texas, within a few days after the kits went on sale.

THIS IS THE RANGER 28, my new semi-duration model. It's easily capable of flights of up to a minute, and can often do much more. A larger, lighter version of the Ranger 21. It's really something new — prefab plus paper! You'll be surprised at how easy it is to build. Big 7" plastic prop, all interlocking die-cut balsa parts, two colors of tissue, formed landing gear, decals, etc., and a long powerful rubber motor to make a wonderful 28" span long-flying model. Full size plans, too, with step-by-step instructions. People raise their eyebrows when I tell them you can buy it at your dealer's for $1.

HERE'S A PIC OF my new Cessna 180. I think you'll agree it's an all-balsa beauty, even if I do say so myself. 21"wingspan with fine, stable flight characteristics. This is the "champion of business-liners!" Everything's in the kit to make this simplified flying model that looks like the real job — all die-cut balsa parts, formed landing gear, 11" rubber motor, big decal sheet, die-cut windshield, 5" plastic prop, nose spinner, etc. Your dealer has it now, and the price is $1.

AND HERE'S THE SHOT of our very popular Shoestring Racer. Your response has been terrific, so I'm continuing to ship them out. With 18" wingspan and all the parts and trimmings in the kit, you seem to think it's a good flying buy at $1. And that's just what your dealer is asking for it. As a flyer, this ship is pretty close to the Ranger 21.

BY NOW SOME OF YOU may have seen the movie "Spirit of St. Louis" with James Stewart. Isn't it a thrilling film! Your dealer has my model kit — the only all-balsa rubber-powered flying model — of the plane Lindy flew. They're $1, too. 21" wingspan, all die-cut balsa parts, in fact everything needed to make a miniature duplicate of the ship that gave the world its greatest flying thrill! Best time with this model so far is by Gerald Elliott of Grosse Point, Mich. — 1 min. 13 sec. — sanded very light.

I'VE PUT A PICTURE below of the Ranger 21 that a great many of you like. Dealers have sent in many re-orders on this one so I know it has your approval. It's nice to know that I designed one that you like so well. To repeat our claim — it's the best flyer in its class! 21" wingspan and complete at $1 too.

NOW HERE'S THE BIG NEWS I have for you. To help increase your flying fun, I'm going to make the following offer, good until Sept. 30, 1957. Get up a simple flying contest with your friends, (or perhaps your Scoutmaster will run it) with 50c each as an entry fee, to be used for prizes. Make it a contest for Carl Goldberg $1 models. Collect all the kit boxes for the planes in the contest. Then just cut out and send me the names of the planes, from the front of each box, plus the entry fee money, and I'll promptly send you planes, engines, etc., that you pick from the list below to be used as your contest prizes:

- 3 names plus $1.50 for ½A Blazer, a $2.50 value.
- 5 names plus $2.50 for ½A engine, a $3.95 value.
- 8 names plus $4.00 for Blazer and engine, a $6.45 value.
- 12 names plus $6.00 for wrist watch, a $9.95 value.
- 20 names plus $10.00 for camera or electric drill, a $19.95 value.

Here is how you might run the contest. Hold it in a park or large school playground. Time the models with a stopwatch or sweep second watch. Give everybody five flights, longest flight wins. I suggest you cut the time of the Ranger 28 in half, so as to give the other ships a fair chance.

And listen to this — the one who sends in the most Carl Goldberg plane name cut-outs for the above prizes by Sept. 30, 1957, will receive in addition FREE a genuine $59.50 Transistor Portable Radio as a grand prize token of my appreciation.

Tell your dealer about it, too. He can tell other fellows about your contest, and the more entries the more prizes. So what do you say — let's build these planes and LET'S GET FLYING!

Carl Goldberg

P.S. The easiest way to get these planes, of course, is to see your dealer. If no dealer near you, or he doesn't have them, send me cost of plane plus 25c each for postage and packaging. Better yet, send cost of any three and I'll pay the postage!

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Most builders would stop here and say that they've got what they want. Not our SEV Special Team! We felt that there was a combination that would bring us over the century mark consistently, so we continued experimenting.

The fifth design built was similar to the present one but with the ability to vary different sections and weights for comparisons. After about two months of discussing, trying, changing and flying we came upon the design combination now used in our present Rat Racer. You'll notice that the ship is now sporting a low aspect-ratio wing. Throughout all the trials with our fifth ship it was found that this type of wing did help to increase the speed without greatly hindering the flying characteristics.

The design of the ship that we are presenting here, now has over 65 flights under its belt without a single mishap (other than a few, broken props). The plane has flown in weather ranging from 60 degrees to 8 degrees above zero and we have noticed that there has been no appreciable difference in performance. During all its flights, the SEV Special Custom Rat Racer III has never gone under 100 mph, except in one instance when there was dirt in the fuel line, and even then it put in an average time of 95.6 mph. The speeds this custom Rat Racer has flown in three of our Des Plaines Piston Poppers' Club races averages 104.4 mph. But higher speeds were to come.

Very recently, the new Fox Hi-Nitro fuel has come on the market. We decided to try some. Normally, this fuel would be too "hot" for an ordinary engine but the engine we are using happens to be a two year old Torp .35 modified somewhat for

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more efficient breathing. As you can probably guess this motor with its many hours of time is mighty loose, which is just the thing for the new Fox Hi-Nitro fuel. The first two flights using the new Fox fuel ended rather abruptly with the engine quitting. This we found was due to the more critical setting needed for this type of fuel. No damage being done, and not to be discouraged, we tried again and much to our amazement the speed was 112.7 mph average over the 68 laps flown on that occasion. It was rather hard to believe that we could jump so easily our average speed. Many flights proved that these speeds were consistent, the only disadvantage being a more critical needle-valve setting.

Now for all you hot Rat Racing enthusiasts, here is the building data on this winning SEV Special Custom Rat Racer.

First study the plans and, after you decide to start, note the scale drawings for the fuselage formers and side plates. These should be made first. Next, cut out your motor mounts to the correct size. (About the only type of wood for mounts that we have found that will stand up to any extent are those of maple or oak.) You will notice that the type of tank is shown on the drawing. It is important to use this tank as the ship is designed around it. Now assemble and glue the boxfront end which is made up of the pieces you have just cut out, namely: plywood formers F-1 & F-2, plywood nose doublers, motor mounts, and plywood mount plate. In the assembling of the above unit be certain that the tank will fit snugly between the formers and the nose doublers. Why all the plywood in the front end? This is the secret of being able to obtain maximum engine power—a solid front end. Bend landing gear according to the plan and mount securely with J-bolts to the landing gear plate. Cement balsa sides to the front unit and add the rear formers. Cement in the landing gear plate. Cement in tail skid plate with blind mounting nuts in place. Mount engine with no offset, using blind mounting bolts. Cross plank bottom of fuselage.

Construct wing and stab as shown on the plans. Assemble elevator to the stab using plenty of hinges—with the speeds this heavy ship travels you will need them. Install control systems in the wing and stabilizer. Cement wing and tail section to the fuselage taking note of the balance point shown on the plans. Add pushrod and cut-off actuator. Carve and hollow top block and install. Now cut out rudder and cement to complete construction. For added strength, fillet underside of wing and stabilizer to fuselage.

Note that the elevator horn is mounted on plywood plates and that the pushrod hole in the horn is bushed. At speeds of 100 mph and better you'll find that details like these really pay off. Keep paint job light.

We have had most consistent results with a 9/7 Tornado prop but it is still a good idea to experiment.

Triple Threat

(*Continued from page* 36)

the gear would ordinarily bend forward. For simplicity, shock absorbing, and rigidity this gear was a pleasant surprise. The two metal straps bolt to ¾ inch ply. The rubber bands pull over the hook when the removable nose top is lifted.

Fuel system: The nose is big enough to take a clank tank, a plastic bottle tank, or at least two Walker tanks. Several arrangements were tried but it was found that the pressure tank and regulator gave consistent results. The pressure system has its annoyances, true, but when it works nothing works better. Carry a spare tank and regulator. A sport fuel, such as Testors 39 or Supersonic 100, gives desirable results with the power and weight of the original ship. Anything from a 10 x 4 to an 11 x 4 propeller is ok, though

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the smaller size gives faster climb and more exciting performance. The larger props give more time to react. More power is unnecessary if the ship is not heavy and is properly rigged.

Radio: One of the new Essco two-tube hard-tubers was used. This type of receiver appears superior to the gas two-tubers which suffer from manufacturing variations in the tubes themselves. Also, the receiver is not so vulnerable to interference just off 27.255. One gas tube receiver was troubled by interference during a flying session with the Triple Threat, which was not bothered. Battery complement shown—three intermediates and two 30v hearing aides in parallel, is more than necessary. The receiver is satisfactory on two pencells; the escapements can take four pencells. The arrangement shown is not a handicap, is reasonably light and is good for several dozens of flights.

Construction is orthodox and anyone who has built a radio model, or thinks he can tackle this one, requires no "now-glue-this" information. Rather than give building instructions, it was felt that comments on this interesting test project would be preferred. Main purpose of the test was to find out what could be done with VariComps escapements. We might add a word of warning: do not have fore and aft slop in the torque rod system yet, at the same time, be sure the escapment arm and pin does not bind against the bushing, or press tightly against the front of the cam.

Radio Control News

(*Continued from page* 25)

Last month we told you that a resistor is a valve device for DC and most AC circuits. The valving action to the flow of current is dependent upon the resistance of the resistor; the voltage, we shall assume, remains the same. The next major item in almost any circuit is a capacitor. There are a variety of capacitors, used to perform their function in different types of circuits. However, you can assume, for all practical purposes, that a capacitor acts as an open switch in a DC circuit and as a closed switch in an AC circuit. Before you take this statement completely at face value, it should be mentioned that there are basically two types of capacitors used in RC work, the electrolytic and the ceramic or paper type. The ceramic and paper types are most generally used, with mica capacitors being used for applications where stability is required. A mica capacitor is built in much the same manner as a paper type. The electrolytic type must be used in a DC circuit, since it has a

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A COMPANION XMTR for this receiver, and others also is our new **HIGH POWER 5 WATT MAC II** hand held XMTR. Uses the popular dual 3D6 tubes for stable output. Components used in this XMTR are designed for transmitting at high frequencies. Receiver parts will operate fairly well in XMTRS but for top performance & long reliable range best results are always obtained with materials designed for transmitters. This XMTR is housed in handsome grey metal case only 4 x 5 x 6 with sturdy 6 ft. whip antenna. Transmitter is never obsoleted, can always be used as foundation unit for ground case job with built-in 2 volt cell and power supply. In this way you need not keep changing equipment as you "grow" with the hobby. Your initial investment is always good. Price of this unit **$21.95**

Wired-tested RF assy. for use to modernize or to build up your own preferred layout are available as follows: Model XM13J, complete 5 watt MAC II RF assembly with a keyer jack built-in, uses RF chokes to kill hot keyer cable, complete with crystal and tubes **14.95**
Model XM13P, as above, w/keyer button **14.95**
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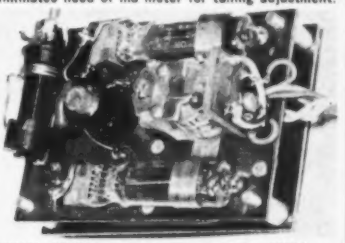
All models supplied with antenna tuning indicator; eliminates need of ma meter for tuning adjustment.



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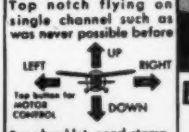

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definite polarity and cannot be used in an AC circuit. Now let's see just how a capacitor works and how they are made.

A capacitor is used to store an electrical charge. This electrical charge is stored on the surface of the capacitor plates, the space between the plates being the dielectric. Fig. 1 shows the basic design of a capacitor having two plates, which are always needed, and one having six plates. The dielectric material, upon which the value of the capacitor partially depends, may be air or a variety of other materials such as ceramic, paper, mica or glass. It should be stated at this time, that there are a great number of different types of capacitors and different physical packages. Due to the color coding system used, some capacitors may appear to be resistors. Many of the disc capacitors, and some tubular ceramic types, in addition to most paper types have the actual value printed on them. Fig. 2 shows the majority of configurations of capacitors you will generally encounter.

In operation, such as in Fig. 3, the capacitor is connected to a DC source, with a switch in series. When the switch is closed, there is an instantaneous transfer of electrons from plate A to the positive battery terminal, and a like number of electrons will be transferred from the negative battery terminal to plate B. When the charge built up between the plates equals the charge in the battery, electron, or current, flow stops. If the switch is opened now, the plates A and B maintain their charge until they are shorted together. Actually, there is no perfect dielectric material and therefore there will be a resistance between the plates and thus a flow of electrons occurs. This leakage current discharges the capacitor. The time required to charge a capacitor depends upon the size of the capacitor and the voltage applied.

As was previously stated, a capacitor acts as an open switch, or block, to the flow of current in a DC circuit. An AC circuit may give the illusion of current flowing through the capacitor. However, this is what happens. Since AC is a sine wave, the voltage rises on the first half of the cycle and the capacitor charges. When the voltage reaches a peak on the first half of the cycle, it then falls to zero and the charge leaks off through the circuit. The second half of the cycle, being of opposite polarity, helps to discharge the capacitor and then charges it to the opposite polarity. The oppostion of a capacitor to the flow of AC is known as capacitive reactance. Capacitive reactance, or impedance, decreases with an increase in frequency, provided the capacity remains the same. Other points which may interest the RC builder are: what determines the voltage rating of a capacitor; and just what type should he use for the purpose? The voltage rating depends upon the thickness of the dielectric and the type of dielectric. The thicker the dielectric, the higher the voltage breakdown rating; however, the capacity decreases. You'll notice that most very very small capacitors, from a physical standpoint, have a low voltage rating. The type of dielectric used can vary the voltage rating from about 20 to 2500, based on a breakdown of volts per .001 in. thickness. Electrolytic capacitors will be discussed at a later date. For those who are interested in formulas, Fig. 4 shows the formula for determining the capacity of a unit, if certain factors are known, and also for calculating the impedance of capacitor at a given frequency. Just how resistors and capacitors function in a circuit will be covered later, when

(*Continuel on page 60*)

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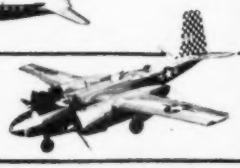

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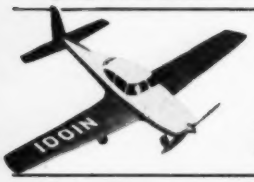

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all other individual components have been discussed. Next month we'll talk about chokes and coils.

Since there is an interest in the difference between model RC controls and those used in drone equipment, we presented the drone receiver schematic over a year ago. Now we can show you the latest in drone receivers, designed and manufactured by Babcock. Mr. "Stu" Babcock sent in the picture of the top view of their 5-channel receiver. Here is some technical data on this Babcock drone unit. Flight reliability is 98%, for all causes, and the receiver is powered by a 28v storage battery, high voltage being supplied through a vibrator supply. RF frequency is tunable from 57 to 74mc and the set has a sensitivity of 3 microvolts. Range is in excess of 100 miles when using the Babcock designed 12 watt (output) transmitter. Four channels are used for left-right and up-down, the fifth channel being a fail-safe channel. Upon loss of the carrier tone (955cps) and after a delay of ¾ second, the parachute relay opens, which in turn opens the chute hatch. As the hatch opens, the engine is cut off and the chute opens. The elevator is trimmable over the entire range and turns and rolls are accomplished by ailerons, no rudder being used on the OQ19D drone plane.

Another novel feature of the system is the Gyro Servo which controls the roll command. The OQ19D has little lateral stability and this gyro takes over. Normal flight duration is one to one and a half hours at speeds of about 225mph.

NEWS ITEMS

Ace Radio Control, Higginsville, Mo., features Allen-Bradley pots with a 60-degree rotation. Available in 100k and 1 meg sizes, these $2.50 pots will allow

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full-swing realistic stick control without going through gears or levers. We might mention here, that the Allen-Bradley pots are noted for their stability and re-trace characteristics. This is due to the fact that the resistance element is molded into the base instead of being sprayed or screened on a phenolic wafer, such as is common with many other pots. Ace also advises that the Burgess Battery Company, Freeport, Ill: (c/o Public Relations Department), has a limited supply of brochure sheets giving recommended batteries for practically every RC receiver and transmitter manufactured or published.

The GEM relay, familiar to all RC'ers, is now available for mounting on printed wiring boards. Tab terminals are used in place of the solder lug type, otherwise the relay remains unchanged in size and performance. No prices were available at the time this was written. This looks like a natural for a manufacturer of RC gear.

Those of you who are looking for something new in an RC plane kit may find just what you want in the new JETCO Mooney Mite. This 45¾" scale low wing will take engines from .065 to .099 and the plans feature the Babcock Magic Carpet receiver. All flying surfaces are detachable. Designed for the PAA-Load event, this model is capable of taking the weight of the RC installation and still maintain its good flying characteristics.

Bonner Specialties, 2900 Tilden Avenue Los Angeles, Calif. has done it again. Their new servo is available now at $14.95 and this unit looks good indeed for single channel and multi-channel ships alike. Unit measures 1¾" x 1 15/16" x 2¼". Weight is 3 ounces. Operation may be had on 1½ to 3 volts, with the pushrod travel adjustable from 9/16" to 1". To insure smooth non-binding operation, nylon to metal gears and worm threads are used. Ball bearings and double staggered brushes make the motor extremely reliable in starting and smooth in operation. Perhaps one of the main features of this unit is that it can be neutralized within plus or minus .007", linear motion. Rhodium plating on the circuit board provides tarnish free surfaces, resulting in better electrical contact.

There was a time when it seemed that everything new was in the relay line. This month it is receivers and you really have your choice in performance and price.

One is the new ESSCO Twin Hard Tube receiver, a miniaturized version of a famous German circuit. Measuring 1 5/16" x 1¾" x 2¾", this unit is well built and the components are well protected by a double-deck type of construction. Two 1AG4's draw but 80 ma on the filament and the B plus current is about .25 to .35ma on idle. B supply may be from 22½ to 30v, with the latter recommended. Using 30v, the relay current rises from practically zero to over 4ma. The relay is the new Gem adjustable point model. Incidentally, the new model receivers have the tuning coil and other components lying flat against the chassis, instead of the upright mounting shown in picture. This basic circuit has been test flown and proven over a period of years, therefore you should have no trouble taking this receiver out of the box, following the few simple instructions, and obtaining excellent operational results. This receiver is currently available only in a built-up model, complete with tubes and relay, for about $21.95. Another item of interest with this receiver, is that it is more selective than most carrier-operated units, thus allowing sharper tuning and hence less possibility from picking up

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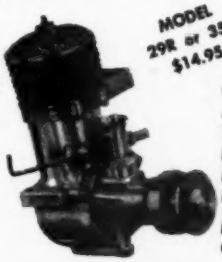

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spurious interference.

Receiver number two, this month, is a new one by Citizen-Ship Radio Corp. also shown in a photo. Measuring 1 3/16" x 1⅝" x 3" and weighing but 2 ounces with relay and protective case, this unit utilizes a tube detector and transistor output stage. Idling current is .5ma with relay current change being 3ma with signal. Note that the sub-miniature 22½v batteries are shown for this set. This could be a trend with the new low-drain single channel receivers. Receiver model MTR, ready built, sells for $26.95 and the kit, model MTK, for $21.95. A printed-wiring chassis is featured and a high pulsing rate is claimed for this receiver. We have not checked a unit as yet, however, on the basis of the reputation of Citizen-Ship Radio, we'd say you couldn't go wrong. Field test data will be forthcoming in later columns.

After a receiver using tubes and one using a tube and a transistor, we now hit a fully transistorized receiver. Photo shows the new CG Electronic Corp. single-channel tone receiver. This is a transistorized version of the RT-1 receiver we wrote up several months ago. Needless to say. NO filament batteries are needed. The B supply is 30 volts and we've operated our unit down to 18 volts. There are certain technicalities with transistor front ends that do not make them follow the pattern of tube detectors, the main one being that a change in B voltage will effect the sensitivity and frequency slightly. However this change is very slight and for all practical purposes, this receiver will work without retuning or readjusting when the B supply drops from 30v down to about 25v. This is a normal life range for U-20 cells. CG states that the transistor version was checked at 5 microvolt sensitivity and over a temperature range of from zero to 130 degrees F. We checked our unit, using a CG T-12 transmitter and a BADCO 180T transmitter, to a distance of 800 feet on the ground. It was checked in a boat to a distance of over 500 feet over water, and flown in a Babcock Breezy Jr. to a distance of approximately 1000 feet. Ground range tests indicated we could have obtained more range but it was too cold and windy for us to go on that day. All in all, we think this is a major breakthrough in RC receiver design. The transistor version sells, ready built for $39.95, and the tube version, described in an earlier column, will be sold in kit form for $29.95. Any transmitter capable of from 95 to 100% modulation, with an audio frequency of between 300 and 600 cps will operate this receiver.

Back in March of this year, we witnessed a demonstration of a model boat at the Texas Instrument booth of the IRE show. The radio equipment was unique in that the receiver and transmitter were completely transistorized—no tubes. This equipment was designed and built by the Thomas Engineering, Inc., 806 Robertson Blvd., Los Angeles, Calif. The model 6TR2 receiver is a two-channel unit, weighing seven ounces and measuring 1¼ x 2¾ x 5¼ and sells for $69.95, less the 22½v battery. This receiver features a printed circuit, on epoxy glass base, a relay current change of 4ma and many potted components for ruggedness and resistance to shock. Operation is said to be reliable even when the 22½ volt battery drops to 15 volts. The frequency tuning range is from 20 to 50mc and the tone frequency is 720 and 1,620 cps. Any conventional transmitter, having the audio tuned to 720 and 1,620cps, may be used. The range is claimed to be five miles with a suitable transmitter. Six transistors are used, which will afford normal operation over a temperature range of from -50c to +85c. A four-transistor transmitter was also shown, using an 18v supply. However, no price has been announced on this as yet. This unit is without a doubt the first step to the equipment of the near future.

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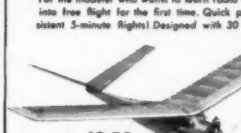

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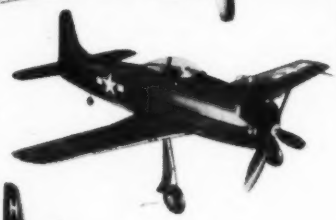
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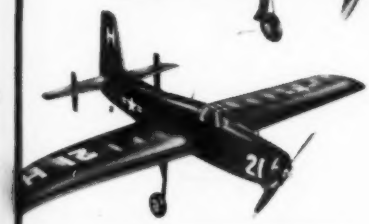
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6 "P-47 THUNDERBOLT"

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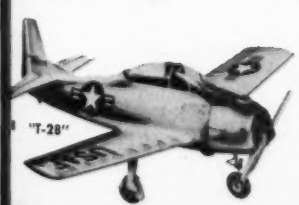
CURTISS HAWK "P-6E"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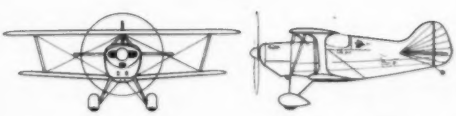

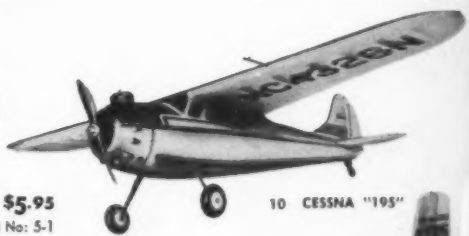
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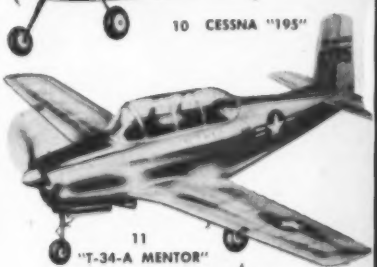
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13
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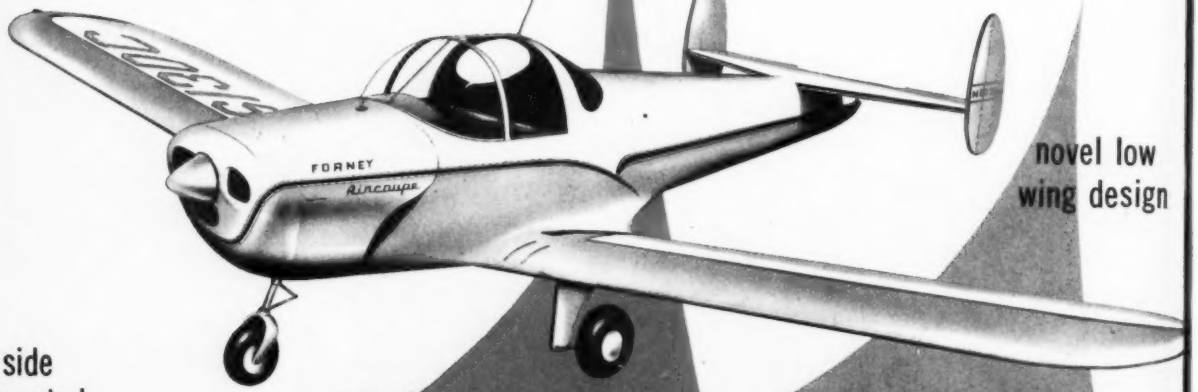

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A genuine competition fuel specially compounded for WINS in all free flight and control line events. May be used straight or as a blend. In an actual test, a FOX 35 Combat Special, using Hi Nitro, produced 60% more power than with ordinary fuels.

$1.25 pint

CAUTION:

Many motors cannot operate with straight Hi Nitro. Your motor should be fueled with a progressively higher proportion of Hi Nitro to Superfuel until no further gain in power is obtained. This "custom blend" is the most efficient fuel for your motor.

Get either fuel at your dealers now. You know it's good when it's CHAMPION!

Champion PRODUCTS

P. O. BOX 1175-A
FORT SMITH, ARKANSAS

MANUFACTURED AND GUARANTEED BY

Berkeley's RADIO CONTROLLED FLYING SCALE Design

FOR RADIO CONTROL — FREE FLIGHT and CONTROLINE

These designs have been selected as ideal for Radio-Control flying. Thrill to the majesty of a perfect scale replica as it wheels to your command high overhead.

CESSNA "172"

- **Adjustable Ailerons** for manually setting trim
- **Operating Wing Flaps** radio or controline actuated
- **Laminated Structure** stronger, lighter, easier

To lighten, strengthen and simplify assembly, the areas you would normally have to plank or carve from block are now die-cut laminations. **$7.95**

BIG 1½" SCALE — 54" WINGSPAN FOR .09 to .19 ENGINES

Here is the latest scale "Cessna" that is a "natural" for radio control. The big proto ship takes-off and lands with "hands-off" control. The model handles just as easy! It's a model builders dream ship!

The kit is very complete in true Berkeley tradition with prefabricated wood parts, silkspan, landing gear and hardware, plus the super-detailed plans and full-colored authentic decals found only in Berkeley Kits.

NAVION "Super 260"

For .29 to .35 Engines Radio Control

For .23 to .29 Engines Free-Flight

For .29 to .65 Engines Controline

(U.S.A.F. designation: L-17) A four place business airplane also used by the U.S. Army and Air National Guard. Originally built by North American Aviation. Power—260 h.p. Lycoming. Maximum speed—163 m.p.h.

$15.95

2" Scale — 68" Wingspan

This beautiful scale replica of the famous "Navion" a fast, rugged and truly different R.C. or Free Fl design, easily adapted to Controline Flying. Thrill its flashing performance and smooth response. A free-flight, it will give you experience and confide in low wing designs. Big, roomy, and well engineer it will set the pace whenever it's flown. Easy to bu

$9.95

Radio Control — Free-Flight — PAA-Load

.15 to .25 Engines—71" Span—2" Scale

"PIPER CUB J-3"

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it's a natural for R.C. or Free-Flight flying. The six foot span permits the extra R.C. installation that you dream about. This is a rugged, detailed, flight proven design. Full-Size Plan with R.C. installations, Authentic Decals, etc.

Army Liaison YL-24

"HELIOPLANE" $3.95

Variable Camber Wing for Two-Speed Radio Control Flying

For .049 to .14 Engines — 39" Wingspan — 1" Scale

The "Helioplane" is the first model that permits the use of scale wing flaps. Depress 10 degrees for free flight; 25 degrees for slow speed control by radio; or raise wing flaps 5 degrees for high speed flight!

48 in. Wingspan

De Havilland

"BEAVE

- **Formed Metal Ring Cowl**

This high aspect-ratio Canadian Bush Flying type aircra is in use by the U.S. Air Force. As a scale design, proportioned and capable of contest performance. In Controline flying, its long moment arm make it ideal landings with motor control, Metal Cowl, Full Size Pl

Radio-Controlled, Free-Flight, Controlline

Radio-Controlled, Free-Flight, Controlline

Piper

"TRI-PACER"

44 in. Wingspan .035 to .15 Engines **$5.95**

This perfect scale R.C. design may be built as a Free-Flight or Controline version if desired. Full Size Plans cover special details for all three versions. Flaps, elevator, rudder, motor and nose gear may be operated by R.C. Ailerons for trim, cabin door access to Radio. Highly Pre-fabricated, Authentic Decals.

$12.95

CESSNA "170"

Radio Control — Free-Flight — PAA-Load .25 to .35 Engines — 72" Span — 2" Scale

Controlling your "Cessna 170" by Radio is a thrill you will not forget! Perfect in scale, rugged, stable in all attitudes, yet responsive in control, with good wind penetration qualities. The gear location is ideal for extended take-off runs. The larger than average size makes it easier to control in windy weather.

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